



Making the Most of Michigan's Energy Future

U-20629: Service Quality & Reliability Standards Workgroup Session #2

January 8, 2020



MPSC

Michigan Public Service Commission

Today's Agenda

Agenda Items		
1:00 pm	Welcome, Introduction and Recap	Charyl Kirkland Electric Operations Section
1:10 pm	Session #1 Comments Summary & Discussion	Charyl Kirkland Electric Operations Section
1:45 pm	Service Quality Standards for Electric Service Staff Multi-State Review	Charyl Kirkland Electric Operations Section
2:15 pm	Break	
2:30 pm	Public Sector Consultants Multi-State Review: Service Quality & Reliability Standards for Electric Service	Eric Pardini, Public Sector Consultants
3:15 pm	Service Quality and Reliability: Areas of Focus	Charyl Kirkland Electric Operations Section
3:45 pm	Closing Statements / February 12 th Session Overview	MPSC Staff
4:00 pm	Adjourn	

U-20629 and U-20630 Orders

- Issued on September 11, 2019
- Order language:
 - Staff lead workgroups “...for the purpose of convening a series of meetings to thoroughly review...” rule sets
 - Will “...look to other states for best practices and optimal standards regarding the rule sets”
 - “...the workgroups will consider current and probable future technological advances in electric distribution systems...”
 - “...the goal is that input from the workgroups will provide a foundation for potential future rule changes that are flexible and responsive to changing technologies...”
- Deliverables:
 - April 30, 2020 (initial report)
 - September 1, 2020 (final report)

The Standard At A Glance

Service Quality and Reliability

- A set of administrative rules promulgated for the purposes of monitoring the service quality and reliability performance of a distribution utility.
- Specifically, these standards are comprised of the following requirements:
 - Unacceptable levels of performance
 - Records and reports
 - Financial incentives and penalties
 - Waivers and exceptions

U-20464 SEA Suggestions: Electric

E-3: The MPSC's electric service quality and reliability rules have not been updated recently and could be modified to enhance safety, reliability, and resiliency of the distribution system. The rules address actions to prevent power outages and system restoration.

The Commission recommends opening a docket to establish a workgroup to investigate and provide Suggestions for updating the Service Quality and Reliability rules and the Technical Standards for Electric Service using lessons learned in Michigan and best practices in other states as a guide.

Workgroup Directives

- Best practices
- Consider technological advances
- Enhance cybersecurity of electric distribution infrastructure
- Implement Suggestions from the Statewide Energy Assessment related to physical and cyber security,
- Flexible and responsive rules that ensure safe, reliable electric service.

Workgroup Information

- Service Quality & Reliability and Technical Standards Workgroup Joint Website: www.michigan.gov/MiPowerGrid/

Michigan.gov

LARA
MPSC

ABOUT THE MPSC | COMMISSION ACTIVITIES | CONSUMER INFORMATION | REGULATORY INFORMATION

MPSC / COMMISSION ACTIVITIES / MI POWER GRID

Electric Service Quality & Reliability Standards and Technical Standards

The MPSC and the public expect utility companies to meet certain levels of performance related to service quality, reliability, worker safety, and physical and cyber security. MPSC rules outline these requirements and need to be reviewed and updated to ensure utilities are held to appropriate standards.



RULEMAKING BACKGROUND

- [Introductory Workgroup Notification](#)

ACTIONS TO DATE

- Annual reports from electric utilities on performance in meeting service quality/reliability standards (U-12270)
 - DTE Electric Reliability and Power Quality Reports (U-16065)
 - Consumers Energy Electric Reliability and Power Quality Reports (U-16066)
- MPSC Staff Informal Multi-State Report of service quality and performance standards in other jurisdictions
- As a result of the Statewide Energy Assessment (U-20464 – Recommendation E-3), the Commission directed Staff to establish workgroups that will look to other states for best practices and optimal standards regarding rule sets. The workgroups will consider current and probable future technological advances in electric distribution systems and electric service, and will recommend changes to the standards in keeping with those advances. The Commission's goal is that input from the workgroups will provide a foundation for potential future rule changes that are flexible and responsive to changing technology and that ensure safe, reliable electric service.

NEXT STEPS

- Investigate and recommend updates to the Service Quality and Reliability Rules and Technical Standards for Electric Service, based on best practices in other states, as well as, recommendations from Statewide Energy Assessment (SEA)
- The stakeholder process will occur from December 2019 to April 2020
- Staff's initial report will be filed by April 30, 2020
- Staff's final report will be filed by September 1, 2020

STAKEHOLDER SESSIONS

DECEMBER 3, 2019

[Agenda](#)

JANUARY 8, 2020

FEBRUARY 12, 2020

MARCH 12, 2020

STAFF LEADS

[Charyl Kirkland](#) (Service Quality & Reliability for Electric Distribution Systems)
[Tayler Becker](#) (Technical Standards for Electric Service)

RELATED MPSC CASE(S)

- U-20629 (Service Quality & Reliability for Electric Distribution Systems)
- U-20630 (Technical Standards for Electric Service)

SIGN UP FOR GRID SECURITY AND RELIABILITY UPDATES

To sign up for updates or to access your subscriber preferences, please enter your contact information below.

*Email Address

Workgroup Information

- All updates will be on this joint website regarding:
 - Workgroup Meeting Details
 - Workgroup Agendas
 - Listserv Announcements
 - Recordings of Each Session
 - Links to Current Standards for Service Quality & Reliability and Technical Standards
 - Presentations
- Comments from each workgroup will be housed in each respective docket.

Upcoming Meetings & Deliverables

Upcoming Workgroup Meetings @ MPSC

- February 12, 2020 9:00 AM-4:00 PM
 - March 12, 2020 9:00 AM-4:00 PM
 - April 16, 2020 (tentative) 9:00 AM-4:00 PM
-
- Deliverables
 - April 30, 2020: Initial Report Due
 - Summary of Workgroups
 - Summary of Stakeholder Comments
 - May-August 2020
 - Stakeholder Review and Comment Period
 - September 1, 2020: Final Report Due



Making the Most of Michigan's Energy Future

Session #1 Comments: Service Quality & Reliability Standards

Summary & Discussion



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Michigan Public Service Commission

Workgroup #1 Comments

- **At the end of Workgroup Session #1, Staff assigned stakeholders this homework assignment:**
- Comments (all):
 - Which standards do you think can be deleted?
 - Which standards do you think should be added?
 - Which standards are the most feasible to implement?
 - Which standards are the least feasible to implement?
- Meter inventory (utilities):
 - What style of meters are currently in the system? (i.e. analog, AMR, AMI, etc.)
 - What Style meters do you plan to have in the system beyond 5-years?

Specific Rules Considered for Revision (Subject to Change)

- R 460.744-746 - update outage credits from \$25 to \$50
- R 460.744-746 – require customer to be notified by the company whether they were accepted or rejected for a credit (30 days)
- R 460.741-747 - require companies to auto generate service credits and require customer specific outage history to be available through utility company portal
- R 460.731-732 – require an annual reliability report for all utilities, including cooperatives
- R 460.724(a) – reduce average customer call answer time from 90 seconds to 45 or 30 seconds
- R 460.722(d) and R 460.732 (j) – reduce same circuit interruption factor from 5 to 4
- R 460.746 - pay service credit if it is over 5 interruptions in a 12-month period instead of 7
- R 460.732 – require utilities to file their Emergency Response Plan every 3 or 5 years
- R 460.732 – require an annual report for each major service interruption

Staff Suggestions

- Strengthen our Service and Reliability existing rules by:
 - Expanding the annual reliability report to include all utilities, not just Consumers Energy and DTE Electric (Currently, Docket Nos. U-16065 and U-16066, respectively)
 - Require annual reporting of reliability metrics SAIFI, SAIDI, CAIDI and CEMI for all utilities, including cooperatives.
 - Reduce the length of time for acceptable customer call answer time from 90 seconds to 45 or 30 seconds.
 - Reduce annual same circuit Repetitive interruption factor from 5 outages to 4 outages

Staff Suggestions (cont'd)

- Require utilities to pay the service credit if a customer experiences more than 5 outages instead of 7 outages.
- Require customers to receive automatic service credits if they qualify and eliminating the requirement for customers to apply for the credit.
- Increase service credits to \$50.00 from \$25.00.
- Consider requiring the utilities to file their Emergency response plan every 3-5 years.
 - Commission Staff suggested it on annual basis; can be filed confidentially.

Staff Suggestions (cont'd)

- Consider requiring a report from each utility after each major service interruption.
- Consider mandating that utilities submit Annual Safety reports of OSHA incidents, and injuries requiring medical attention or property damage.
- Require that utilities send customer credit approval/denial to letters customers within 30 days of application.
- ~~◦ Consider mandating that fines go directly to customers instead of to the State.~~

Workgroup #1 Comments Submitted

- Consumers Energy, DTE Electric, MEGA, MECA, New Energy Advisors, Michigan Fire Department Representatives, and CUB provided responses to Staff's Inquires.
- Most Stakeholders Commented On:
 - Wire Down Response Time
 - Outage Credits (Amount & Automation)
 - Call Answer Time

R 460.701 Application of Rules

- **MECA**: Application to Member Regulated Cooperatives: Rule 460.701 should be updated if MECA members are to be expressly encompassed by the scope of the rules.
 - Rule 701: “Electric utility” means a person, partnership, corporation, association, or other legal entity whose transmission or distribution of electricity the commission regulates under 1909 PA 106, MCL 460.551 to 460.559, or 1939 PA 3, MCL 460.1 to 460.10cc.
 - Electric utility does not include a municipal utility, affiliated transmission company, or independent transmission company. Must follow all requirements of R 460.3101 to R 460.3908

R 460.723 Wire Down Relief Standard

- (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.

R 460.723 Wire Down Relief Requests

- Staff previously held a separate wire down workgroup from September to December 2019. As of December 2, 2019, this initiative was incorporated into this workgroup.
- Several Michigan Fire Departments provided formal comments regarding the current wire down standards that require utilities to relieve first responders from guarding a downed wire within 4 hours for metropolitan areas and 6 hours in rural areas.

R 460.723 Wire Down Relief Requests

- The general consensus from the Fire Departments that responded was that the current standard was too long and not feasible to expect them to guard a wire for up to six hours.
- It was noted that the current gas standard required utilities to respond to a gas leak within one hour.
- Due to this comparison, it was suggested that the standard be reduced to one hour in both metropolitan and rural areas.

R 460.723 Wire Down Relief Requests

- **MEGA:** The current standard is sufficient and not in need of changes.
- **DTEE:** Suggested a subgroup to address this topic.

Annual Reporting: Wire Down

- **MEGA:** The only comment is on the wire down relief factor reporting. MEGA proposes that this be included in the report only when not in compliance outside of a catastrophic event.
 - This is part of an over-arching suggestion that reporting requirements be reduced or eliminated for entities that have a history of compliance while they remain in compliance, particularly for small utilities. Adding another or increased regular reporting requirement, especially if plans do not change, is an unnecessary effort that only adds costs for customers. All reporting requirements should be reviewed as part of the initiative to ensure value for the time and money spent creating them.

R 460.722 (d) Unacceptable Performance

- **Staff Suggestion:** Reduce same circuit interruptions from 5 outages to 4 outages
- **Consumers Energy:** Need to investigate the additional reliability investment needed to achieve this metric.
- **DTEE:** The threshold for duration of an outage that triggers a service credit warrants additional discussion, as there are operational and storm condition challenges that utilities must work through to restore power.

R 460.722 (d) Unacceptable Performance

- **MEGA:** It is unclear what is driving the proposal of five as the appropriate number. Without data or other support for the particular reduction proposed, MEGA members view the current rule as sufficient to gauge local reliability performance at a level that is appropriate for customer compensation.

R 460.744-746 Outage Credits--\$50.00

- **Staff Suggestion: Increase Credit from \$25.00 to \$50.00**
- **Consumers Energy:** Company would like to discuss origin of \$50. Additional analysis, including customer satisfaction data should be consulted to determine the best way to improve the customer's experience
- **DTEE:** service credits for multiple outages should be handled through a proactive process that is easier for the customer. Also, DTEE is open to discussing the credit amount. The amount of the credit should be supported with analysis and not be set arbitrarily. We look forward to further evaluating what this process could look like within the context of a focused subgroup.

R 460.744-746 Outage Credits

- **CUB: A** In order to move this standard toward the reality that Michigan utility customers actually experience, CUB suggests that instead of a flat \$25 credit, the credit should be calculated on an hourly basis. By doing so, the MPSC would be recognizing the fact that costs for customers compound over time. The commission would also be giving utilities additional incentive to work to reduce power restoration times.

- R 460.744-746 Outage Credits
 - **MEGA:** MEGA members have relatively few instances which require credits to be issued. With few occasions to have to issue credits, and there being costs for reconfiguring customer metering and billing systems to track and verify the accuracy of the information, implementation would be costly.
 - Also, as noted in the metering information above, most members are either in the process of adopting AMI or not currently considering AMI. This information, again, renders the value of instituting this additional requirement on small utilities more costly than the value provided to the customer (who would still receive the same credit). An exemption for small utilities would be prudent.

- R 460.744-746 Outage Credits
 - **MECA:** while consideration is being given to increasing the amount of bill credits, additional consideration should be given to MECA members being exempt from bill credits.
 - MECA's members service customers who themselves are members. Those customer/members ultimately absorb the costs of credits, penalties and fines.
 - Additionally, given the frequency and greater intensity of severe weather events which affect a utility's ability to restore service, it makes sense to consider changes to definitions in R460.702 and alternative methods for relief from restoration of service timelines under such conditions.

- R 460.744-746 Outage Credits-CUB
 - A 16-hour, 24-hour or 100-hour outage results in the same credit. The standards' rigid thresholds for unacceptable performance of 16 hours for normal conditions and 120 hours for catastrophic conditions have made more sense in an era in which less sophisticated technology meant it was difficult to record precise numbers, but seem very outdated in an era where advanced metering infrastructure is widely available.

- R 460.744-746 Outage Credits-CUB
 - CUB suggests the following: Begin with a bill credit of \$2 per hour of outage or portion thereof, including major event days. In order to incentivize the utility to improve performance, the utility's ability to recover the costs of these credits would be tied to its performance relative to the national average SAIDI (another reliability index that measures the average number of minutes of outage that the average customer experiences in a year).
 - Specifically, the \$2 per hour credit would be multiplied by the national average SAIDI to determine the amount of revenue that can be recovered. Based on the analysis on the duration of outages in our performance report, under this scheme the average Michigan customer would receive about \$28 per year in bill credits, of which about \$12 would be recovered by the utility in rates.

R 460.744-746 Outage Letter

- Staff would like to require utilities to notify customers of acceptance or rejection of application for service credit within 30 days
 - **Consumers Energy:** Would like to discuss other channels to communicate with customers beyond traditional mail.

R 460.741-747 Automatic Credits

- **Staff Suggestion: Make the Outage Credit Automatic When Customer Meets Criteria**
- **CE:** Would need to determine costs and feasibility to automate credits with Information Technology systems
- **DTEE** recommends addressing changes to SS-4, 5, and 6 and all repetitive interruption and service credit items together in a focused subgroup where the various topics can be addressed holistically. These standards are interrelated, and their overarching policy objectives need to be defined prior to analyzing potential changes to this set of standards. This may be addressed in a focused subgroup.

R 460.741-747 Automatic Outage Credits

- **CUB:** The requirement that bill credits be issued automatically is an imperative. The prevalence of AMI across the Consumers Energy and DTE service territories gives the utilities a strong foundation from which to build a system of automatic credits. It is not realistic to expect customers to know what an acceptable level of performance is under state administrative law. The costs of upgrading IT systems should be explored in future workgroup meetings, but those costs should not stand in the way of customers having access to the full benefits of their advanced meter infrastructure

R 460.741-747 Automatic Outage Credits

- **MEGA:** Members have relatively few instances which require credits to be issued. With few occasions to have to issue credits, and there being costs for reconfiguring customer metering and billing systems to track and verify the accuracy of the information, implementation would be costly.
- Most members are either in the process of adopting AMI or not currently considering AMI. This information, again, renders the value of instituting this additional requirement on small utilities more costly than the value provided to the customer (who would still receive the same credit). An exemption for small utilities would be prudent.

Major Service Interruption Reporting

- **Staff Suggestion: Require Report to Commission After Each Major Interruption**
- **DTEE** is open to the continued use of orders for storm reporting or for further discussing alternatives to update the MPSC after each major service interruption. In response to MPSC orders, DTEE already submits reports after major service interruptions that explain DTEE's system reliability performance and company response efforts taken during large storms.

Major Service Interruption Reporting

- **MEGA:** This is part of an over-arching suggestion that reporting requirements be reduced or eliminated for entities that have a history of compliance while they remain in compliance, particularly for small utilities. Adding another or increased regular reporting requirement, especially if plans do not change, is an unnecessary effort that only adds costs for customers. All reporting requirements should be reviewed as part of the initiative to ensure value for the time and money spent creating them.

Customer Portal Outage Information

- **MEGA:** Another change raised for consideration is to have customer specific outage history available through a utility portal. Compliance with such a requirement would be costly and difficult for utilities that do not utilize AMI meters, which includes several MEGA members.
- Should this idea be adopted, an exemption for small utilities or those that do not have AMI should be included.

R 460.724 (a) Reduce Call Answer Time

- **Staff Suggestion: Reduce Call Answer Time From 90 Seconds to 45 or 30 Seconds**
- **DTEE:** We strive to keep customer call answer times below the 90 second standard as a business practice. DTE would like to further analyze the customer satisfaction impact and potential cost and staffing implications of reducing call wait times from 90 seconds to 45 or 30 seconds.
- **Consumers:** Would need to secure recovery of cost prior to implementing new standard and would require additional staffing and funding to support this standard

R 460.724 (a) Reduce Call Answer Time

- **MEGA:** Resource availability for small utilities is an important consideration in understanding the impact of proposed changes. An exemption for small utilities would be appropriate in this instance as the cost of adding resources to meet this fairly significant change may not provide commensurate value to customers.

Additional Rule to Consider

- **Consumers Energy:** R 460.702 and R 460.722—discuss creation of additional categories and the current definitions of “normal” and “catastrophic”. The implementation of additional categories should drive adjustments to R 460.732 (g) (h) and (i) Annual Report Contents.

Additional Rule to Consider

- **CUB:** The Service Quality standards have two categories for unacceptable service as based on outage duration: 16 hours or more under “normal” grid conditions and 120 hours or more under “catastrophic” grid conditions.
- CUB argues that these categories represent arbitrary thresholds that do not reflect the reality of the economic harm experienced by customers during power outages.

Annual Reporting Requirements: Suggested Updates

- Part 3: Records and Reports

R 460.732 Annual Report Contents

- Wire Down Relief
- Meter Read
- New Service Installation
- Complaint Response
- Average Call Answer Time
- Call Blockage
- Outage Restoration—Normal
- Outage Restoration—Catastrophic
- Outage Restoration—All Conditions
- Same Circuit Repetitive Outage
- **SAIDI, SAIFI, CAIDI**
 - 5 year rolling average
 - With and Without Major Event Days

- **DTE ELECTRIC & CONSUMERS ONLY:**
 - **CEMI 0-10+**
 - **CELID 60hrs and CELID 8hrs (excluding catastrophic events)**
 - **New \$25.00 Outage Credit Directives**
 - **List of their 10 worst performing circuits for the prior years in terms of SAIDI & SAIFI**
 - SAIDI and SAIFI excluding major events for the year
 - Circuit name, number and location
 - Length of circuit (miles)
 - Number of customers served
 - Substation name
 - Last circuit trim
 - List of outages and causes
 - Corrective action plan to improve performance

Reliability Metrics

Measuring Performance of Electric Distribution Systems

IEEE Standard 1366-2003

SAIFI, SAIDI, CAIDI, CEMI, CELID

- IEEE 1366-2003

The 2.5 Beta Methodology allows segmentation of reliability data into two distinct sets for review.

- One set represents those events of such a reliability magnitude that a crisis mode of operation is required to adequately respond. (major events).
- The other set represents the reliability impact of those events that a company has built the system to withstand and staffed to respond to in a manner that does not require a crisis mode of operation. (day-to-day operation).

- Reliability Metrics

SAIFI = System Average Frequency Duration Index

The number of outages an “average” system customer experienced in a given year

$$\frac{\sum \text{Number of Customer Interrupted}}{\text{Number of Customers Served}}$$

Reliability Metrics

SAIDI = System Average Interruption Duration Index

The number of outage minutes an “average” system customer experienced in a given year

$$\frac{\sum(\# \text{ Customers Interrupted}) * (\text{Restoration Times (minutes)})}{\text{Number of Total System Customers}}$$

CAIDI

CAIDI = Customer Average Interruption Duration Index

CAIDI gives the average outage duration that any customer may experience.

It can also be viewed as the average restoration time

$$CAIDI = \frac{\textit{Total Duration of Customer Interruptions}}{\textit{Total Number of Customer Interruptions}} = \frac{SAIDI}{SAIFI}$$

Customers Experiencing Multiple Interruptions (CEMI)

- CEMI reporting was added to reliability reporting in order to give Commission Staff a clearer view on exactly how many customers were experiencing outages due to lack of customer participation in the Outage Credit Program
- CEMI₀ through CEMI₁₀ will show exactly how many customers endure 0-10 outages per year

Customers Experiencing Long Interruption Duration

- CELID_{60hrs} shows how many customers have experienced an outage longer than 60 hours for each catastrophic storm event
- CELID_{8hrs} shows how many customers have experience an outage longer than 8 hours, excluding catastrophic events
- CELID will show Commission Staff circuits/areas where customers have experienced extended outages during the calendar year

Reliability: Momentary Outages

- New Energy Advisors: Very important to consider the tracking and reporting of momentary interruptions. With AMI and more grid automation, it is becoming much easier. Momentaries have a real cost see, for example, p. 31 of <https://emp.lbl.gov/sites/all/files/lbni-6941e.pdf>) that should not be ignored

New Energy Advisors

Based on the weighted-average interruption cost estimate, Table 3-8 provides cost per event (equal to the weighted-average interruption cost), cost per average kW and cost per unserved kWh for medium and large C&I customers. Cost per unserved kWh is relatively high for a momentary interruption because the expected amount of unserved kWh over a 5-minute period is relatively low.

Table 3-8: Cost per Event, Average kW and Unserved kWh – Medium and Large C&I

Interruption Cost	Interruption Duration					
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours
Cost per Event	\$12,952	\$15,241	\$17,804	\$39,458	\$84,083	\$165,482
Cost per Average kW	\$15.9	\$18.7	\$21.8	\$48.4	\$103.2	\$203.0
Cost per Unserved kWh	\$190.7	\$37.4	\$21.8	\$12.1	\$12.9	\$12.7

New Energy Advisors

- This becomes even more important when utilities install reclosers and smart switches as part of reliability improvement schemes (e.g., “self-healing grid” or FLISR), where sustained interruptions may decrease but momentary interruptions may increase. The creators of the Interruption Cost Estimate (ICE) Calculator, which is used by many utilities to justify grid modernization investments, acknowledge the importance of accounting for momentary interruptions to avoid over-estimating the benefits of FLISR (see <https://icecalculator.com/documentation>).



Making the Most of Michigan's Energy Future

Service Quality Standards for Electric Service

Multi-State Electric Rules Comparison



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Summary of Staff Survey

- As part of the Statewide Energy Assessment (2019), Staff in the Electric Operations Section gathered comparable power quality and reliability standards data from 10 different states in order to investigate how Michigan reasonably compares to other states.
- Staff researched ten states: California, Illinois, Indiana, Massachusetts, Minnesota, New Jersey, New York, Ohio, Washington State, and Wisconsin.



Multi-State Electric Service Rules Comparison

September 11, 2019

Electric Operations Section
Energy Operations Division
Michigan Public Service Commission



State Selection Criteria

- Staff selected states based on:
 - geography (Midwest states), (east coast states), (west coast states)
 - states that are known for precedent setting policies for their utilities
 - states that have major annual storms that require significant rebuilding (east coast)

Staff's Findings

- Staff found that in totality, Michigan's Service Quality and Reliability Standards were more detailed in comparison to the initial ten states studied. For example, Michigan specifically states what constitutes "normal" and "catastrophic" conditions whereas many of the other states did not have that level of granularity.
- It has been nearly 20 years since these Standards were created and it would be beneficial to gather information via the stakeholder process in order to ascertain which rules would benefit from an update.

Staff Suggestions

- Strengthen our Service and Reliability existing rules by:
 - Expanding the annual reliability report to include all utilities, not just Consumers Energy and DTE Electric (Currently, Docket Nos. U-16065 and U-16066, respectively)
 - Reduce the length of time for acceptable customer call answer time from 90 seconds to 45 or 30 seconds.
 - Require annual reporting of reliability metrics SAIFI, SAIDI, CAIDI and CEMI for all utilities.
 - Reduce annual same circuit Repetitive interruption factor from 5 outages to 4 outages and require utilities to pay the service credit if a customer experiences more than 5 outages instead of 7 outages.

Staff Suggestions (cont'd)

- Require customers to receive automatic service credits if they qualify and eliminating the requirement for customers to apply for the credit.
- Increase service credits to \$50.00 from \$25.00.
- Consider mandating that fines go directly to customers instead of to the State.
- Consider mandating that utilities submit Annual Safety reports of OSHA incidents, and injuries requiring medical attention or property damage.

Staff Suggestions (cont'd)

- Consider requiring the utilities to file their Emergency response plan every 5 years.
- Consider requiring a report from each utility after each major service interruption.
- Require that utilities send customer credit approval/denial to letters customers within 30 days of application.

• Specific Rules Considered for Revision

- R 460.744-746 - update outage credits from \$25 to \$50
- R 460.744-746 – require customer to be notified by the company whether they were accepted or rejected for a credit (30 days)
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- R 460.732 – require utilities to file their Emergency Response Plan every 3 or 5 years
- R 460.732 – require a report for each major service interruption



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Thank You

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Break



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Eric Pardini

Public Sector Consultants



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Benchmarking Study: Standards for Electric Distribution Utilities

Service Quality, Reliability, and Technical Standards

Eric Pardini, Public Sector Consultants

Michigan Public Service Commission
U-20629 & U-20630 Workgroup Meetings
Wednesday, January 8, 2020



About Public Sector Consultants

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About Public Sector Consultants



Offering a full suite of services in research, implementation, facilitation, and evaluation, PSC has served hundreds of local, state, and federal government agencies, nonprofit organizations, and private businesses.

PSC has more than 60 employees and a roster of affiliated consultants.

Project Team

- Project Lead: Eric Pardini, Director
- Project Team: Maggie Pallone, Jill Steiner, Chris Dorle, Derrell Slaughter, and Alec Esparza



Project Overview

- PSC was engaged by DTE Energy, Consumers Energy, and the Michigan Electric and Gas Association to conduct a benchmarking analysis of Michigan's standards for electric distribution utilities.
- This study focuses on service quality, reliability, and technical standards, as discussed in the Commission's September 11, 2019, Order in Case No. U-20629.

Study Goals

- PSC will support the development of new service quality, reliability, and technical standards for electric distribution utilities by conducting a benchmarking analysis of rules and standards in 25 peer states.
- Will analyze Michigan's current standards, assess standards from peer states, identify common and best practices, and provide potential considerations to inform stakeholders in Michigan.
- This benchmarking analysis will provide the necessary context to compare Michigan's current standards with industry best practices.

Study Approach

- Phase One: Define Scope of Analysis
- Phase Two: Review Existing Standards and Rules
- Phase Three: Research and Benchmarking Analysis
- Phase Four: Develop Study

Scope Definition

- As part of Michigan's *Statewide Energy Assessment Final Report*, Michigan Public Service Commission (MPSC) staff developed a study that analyzed service quality and reliability standards for electric distribution utilities in ten states.
- States were selected based on three criteria—geographic representation from the Midwest, East Coast, and West Coast; states that are recognized for precedent-setting policies; and states where major storms are common.
- Their analysis reviewed standards for California, Illinois, Indiana, Massachusetts, Minnesota, New Jersey, New York, Ohio, Washington, and Wisconsin.
- PSC included these ten states in our analysis.

Selecting Additional States

- PSC developed a methodology to select 15 additional states to include in the analysis based on their similarity to Michigan across a number of variables.
- Through discussion with the client and input from MPSC staff, PSC identified 47 variables for comparing states (available in Appendix 1).
 - Reliability indices
 - Electric industry characteristics
 - State characteristics
 - Tree cover
 - Storms and weather
- In order to select states based on these variables, PSC tested the correlation of 35 variables to states' performance on reliability indices to determine which variables exhibited the highest correlation to reliability performance.

Selecting Additional States

- Nine variables were found to have a statistically significant correlation to reliability performance on one or more reliability indices (see Appendix 2 for correlation results).
 - Percent of tree cover in a state
 - Percent of tree cover in urban areas
 - Communities and the amount of tree cover per capita
 - Percent of a state's population living in urban areas
 - The extent of underground utility infrastructure as a percent of total distribution plant
 - Percent of retail sales to commercial and industrial customers
 - Population change from 2010 to 2018
 - Average annual frequency of electric emergency incidents and disturbances
 - Percent of utility customers for whom outages are automatically reported

Selecting Additional States

- First, PSC calculated descriptive statistics (mean, median, standard deviation, and quartile performance) for selected variables.
- Using these selected variables, PSC created a three-tiered approach to identify states that exhibited similar characteristics to Michigan.
- Tier one included the three variables with the most significant correlation to reliability performance—tree cover, population living in an urban area, and the extent of underground infrastructure deployment.

Selecting Additional States

- Michigan has tree cover over 59.5 percent of its land area compared to the national average of 44 percent, putting the state in the third quartile.
- Michigan ranked in the third quartile with 74.6 percent of its population living in urban areas. Michigan was only slightly higher than the national average of 74.1 percent on this metric.
- 14.8 percent of Michigan's distribution plant is from underground infrastructure placing the state in the first quartile. The national average for underground distribution infrastructure was 21.7 percent.

Selecting Additional States

- Using the filters from tier one, PSC identified five states—Georgia, North Carolina, Pennsylvania, South Carolina, and Virginia—that shared similarities with Michigan on all three variables.
- Sixteen states were similar to Michigan for two of the three variables and the remaining 19 states shared one or fewer characteristics.
- States with three shared characteristics were identified as tier one states and recommended for inclusion in PSC’s analysis.
- States sharing two characteristics were moved to the second selection tier.

Selecting Additional States

- The second tier examined states' performance in terms of percent of retail sales to commercial and industrial customers and states population change from 2010 to 2018.
- Of the 16 states identified in tier one, six states exhibited similarities to Michigan on both characteristics.
 - Iowa, Kansas, Kentucky, Louisiana, New Mexico, and Oklahoma
- Six states shared a similarity on one variable. These states were moved to the third selection tier.
- Four states were eliminated from consideration.

Selecting Additional States

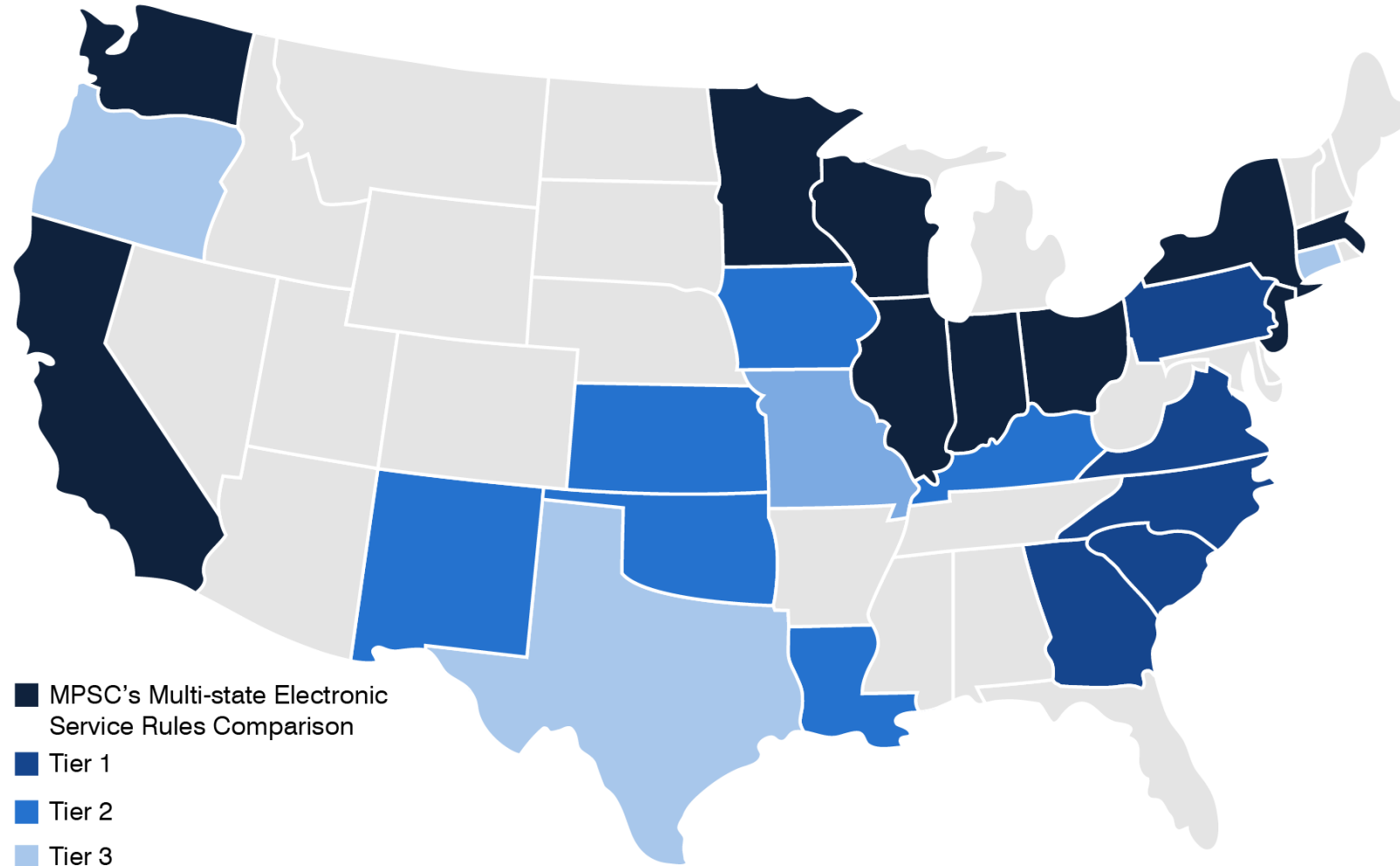
- The third tier for selecting states included the final two variables that demonstrated statistically significant correlation to reliability performance—average annual frequency of electric emergency incidents and disturbances and percent of utility customers for whom outages are automatically reported.
- Four of the remaining six states had similar performance on these two metrics. Connecticut, Missouri, Oregon, and Texas were added to the list of states for analysis.
- PSC's state-selection methodology identified 15 states for inclusion in the benchmarking analysis.

Selected States

MPSC's Multi-state Electric Service Rules Comparison

		Tier 1	Tier 2	Tier 3
1.	California	11. Georgia	16. Iowa	22. Connecticut
2.	Illinois	12. North Carolina	17. Kansas	23. Missouri
3.	Indiana	13. Pennsylvania	18. Kentucky	24. Oregon
4.	Massachusetts	14. South Carolina	19. Louisiana	25. Texas
5.	Minnesota	15. Virginia	20. New Mexico	
6.	New Jersey		21. Oklahoma	
7.	New York			
8.	Ohio			
9.	Washington			
10.	Wisconsin			

Selected States



Phase Two: Review Existing Standards and Rules

- PSC developed a database containing all current standards and rules from Michigan pertaining to service quality, reliability, and technical provisions.
- PSC gathered available reporting on service quality and reliability performance of Michigan utilities relative to state standards to gauge how well the state, as a whole, has been able to uphold the standards.
- PSC also reviewed available information pertaining to the most recent administrative rulemaking process for Michigan's standards to provide important context for how the current standards were developed.

Phase Three: Research and Benchmarking Analysis

- Starting from the inventory of Michigan's current standards, PSC collected corollary standards from other states.
- Standards and rules were compiled primarily from states administrative rules/codes. In some cases, the information sought was contained in general orders from state regulators, other commission proceedings, or statutes.
- Where corollary state rules and standards were not found, PSC made a note reflecting this.

Phase Three: Research and Benchmarking Analysis

- PSC reviewed the different approaches states have taken to defining performance and technical standards that promote safe and reliable electric service.
- Our reporting will provide a summary of each standard, as well as an analysis of whether other states have similar standards in use and, if so, the extent of states using a similar standard. We will also provide a summary of the range of performance standards and identification of common and best practices.
- PSC will also identify standards and rules that aren't currently contained in Michigan's service quality, reliability, or technical standards.

Phase Four: Develop Study

- PSC is currently wrapping up the research and analysis portion of this work.
- A draft report has been developed and will be completed in January 2020.

Questions?



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Appendix 1. Variables

Reliability Indices

- 2018 Weighted Average SAIDI with MED
- 2018 Weighted Average SAIFI with MED
- 2018 Weighted Average CAIDI with MED
- 2018 Weighted Average SAIDI without MED
- 2018 Weighted Average SAIFI without MED
- 2018 Weighted Average CAIDI without MED
- 5-year Average SAIDI with MED
- 5-year Average SAIFI with MED
- 5-year Average CAIDI with MED
- 5-year Average SAIDI without MED
- 5-year Average SAIFI without MED
- 5-year Average CAIDI without MED

State Characteristics

- Percent of State Economic Output from Manufacturing
- Percent of Population Living in Urban Areas
- Total Population 2019
- Percent Change 1900–1950
- Percent Change 1950–2000
- Percent Change 1900–2018

State Characteristics cont.

- Percent Change 2000–2018
- Percent Change 2010–2018
- Population Density 2010

Electric Industry Characteristics

- Number of Customers, Total Electric Industry
- Total Summer Nameplate Capacity (MWs)
- Total Retail Sales (MWs)
- Percent of Customers (C&I)
- Percent of Retail Sales (C&I)
- Total Distribution Plant 2017
- Percent Change in Distribution Plant 2010–2018
- Distribution Plant Average Annual Growth Rate 2000–2018
- Underground Distribution Infrastructure as a Percent of Total Distribution Plant
- Average Annual Distribution Operating and Maintenance Expenses 2014–2018
- Average Annual Distribution Operating Expenses 2014–2018
- Average Annual Distribution Maintenance Expenses 2014–2018

Tree Cover

- Tree Cover Per Capita (m² per resident)

Tree Cover cont.

- Percent of Tree Cover in Urban/ Community Land
- Percent of Tree Cover Statewide
- State Tree Cover (hectares)
- State Tree Cover (square meters)
- State Tree Cover per utility customer (m² per customer)

Storms and Weather

- Electric Emergency Incident and Disturbances (2015–2019)
- Billion-Dollar Disaster Costs 1980–2019 (CPI adjusted Dollars)
- Number of Storm Events, Top Ten Types, 2015–2019
- Average Annual Storm Events, Top Ten Types, 2015–2020
- Heating Degree Days
- Cooling Degree Days

Distribution Grid Infrastructure

- Percent of AMI Deployment
- Percent of Utility Customers for Whom Outages Are Automatically Reported

Appendix 2. Correlation Coefficients

	Percent of Retail Sales (C&I)	Percent of Underground Distribution Infrastructure	Percent of Population Living in Urban Areas	Tree Cover Per Capita	Percent of Tree Cover in Urban/Community Land	Percent of Tree Cover Statewide	Total State Tree Cover	Tree Cover per Utility Customer	Electric Emergency Incidents and Disturbances	Percent of Customers for Whom Outages Are Automatically Reported	Percent Population Change 2010–2018
SAIDI With MED	-.384**	-.501**	-.294*	.497**	.553**	.664**	0.176	0.119	0.179	0.048	-0.225
SAIFI With MED	-0.189	-.618**	-.568**	.499**	.447**	.543**	0.106	0.228	0.052	-0.172	-.329*
CAIDI With MED	-.373**	-0.220	-0.003	.454**	.568**	.621**	-0.045	-0.059	0.119	0.219	-0.231
SAIDI Without MED	0.030	-.516**	-.434**	0.175	0.160	.296*	.360*	.343*	.383**	-0.196	-0.252
SAIFI Without MED	-0.050	-.594**	-.561**	.333*	.289*	.372**	0.168	.307*	0.076	-.285*	-.282*
CAIDI Without MED	0.148	0.044	-.351*	0.070	0.049	0.163	0.206	.293*	0.119	-0.057	-0.204

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).



Making the Most of Michigan's Energy Future

Service Quality & Reliability Standards: Areas of Focus



MPSC

Michigan Public Service Commission

Staff Suggestions

- Strengthen our Service and Reliability existing rules by:
 - Expanding the annual reliability report to include all utilities, not just Consumers Energy and DTE Electric (Currently, Docket Nos. U-16065 and U-16066, respectively)
 - Require annual reporting of reliability metrics SAIFI, SAIDI, CAIDI and CEMI for all utilities, including cooperatives.
 - Reduce the length of time for acceptable customer call answer time from 90 seconds to 45 or 30 seconds.
 - Reduce annual same circuit Repetitive interruption factor from 5 outages to 4 outages

Staff Suggestions (cont'd)

- Require utilities to pay the service credit if a customer experiences more than 5 outages instead of 7 outages.
- Require customers to receive automatic service credits if they qualify and eliminating the requirement for customers to apply for the credit.
- Increase service credits to \$50.00 from \$25.00.
- Consider requiring the utilities to file their Emergency response plan every 3-5 years.
 - Commission Staff suggested it on annual basis; can be filed confidentially.

Staff Suggestions (cont'd)

- Consider requiring a report from each utility after each major service interruption.
- Consider mandating that utilities submit Annual Safety reports of OSHA incidents, and injuries requiring medical attention or property damage.
- Require that utilities send customer credit approval/denial to letters customers within 30 days of application.

Staff Suggestions (cont'd)

- ~~◦ Consider mandating that fines go directly to customers instead of to the State.~~
- Explore the addition of Momentary Outage Reporting.
- Reduce the Wire Down Relief time from 4-6 hours to 2-4 hours or 1-2 hours.
- Amending the current definitions of “normal” and “catastrophic” to include a third category.
- Look at amending “unacceptable” vs “acceptable” on an hourly basis (CUB)

Areas Of Agreement (Majority)

- R 460.731-732 – require an annual reliability report for all utilities, including cooperatives
- R 460.732 – require a report for each major service interruption
 - Consider mandating that utilities submit Annual Safety reports of OSHA incidents, and injuries requiring medical attention or property damage.

Suggested Subgroup(s)

- Reduce annual same circuit repetitive interruption factor from 5 outages to 4 outages and require utilities to pay the service credit if customer experiences more than 5 outages instead of 7 outages.
- Require customers to receive automatic service credits if they qualify and eliminate the requirement for customers to apply for the credit.
- A new category to add to “normal” and “catastrophic” to capture events that are more severe than “normal” but not severe enough to be classified as “catastrophic”.
- Increase service credits to \$50.00 from \$25.00.
 - DTEE recommends addressing changes to the above standards and all repetitive interruption and service credit items together in a focused subgroup where the various topics can be addressed holistically. These standards are interrelated, and their overarching policy objectives need to be defined prior to analyzing potential changes to this set of standards. This may be addressed in a focused subgroup.



Making the Most of Michigan's Energy Future

Looking Ahead



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Michigan Public Service Commission

Next Workgroup Meeting

February 12, 2020 @ MPSC

Service Quality & Reliability: 1:00PM-4:00PM

Homework due by January 24, 2020:

Please provide the following information and add to respective docket in U-20629 (Service Quality)

- Comments (all):
 - New Energy Advisors: “Momentaries have a real cost see, for example, p. 31 of <https://emp.lbl.gov/sites/all/files/lbnl-6941e.pdf>) that should not be ignored...This becomes even more important when utilities install reclosers and smart switches as part of reliability improvement schemes (e.g., “self-healing grid” or FLISR), where sustained interruptions may decrease but momentary interruptions may increase.”
 - Utilities: Do you have the capability to track momentary outages currently? If not, is it something that is going to be incorporated into the future?
 - Businesses: How do momentary outages affect your business?
 - Residential Consumers: How do momentary outages affect you?

Homework due by January 24, 2020:

Please provide the following information and add to respective docket in U-20629 (Service Quality)

- **Comments (Utilities):**
 - **Emergency Response Filings:** How often do you review and update your plans? (This can be filed confidentially.)
 - **Call Answer Time:** What is your current average call response time currently? Have you experienced any issues with handling call volume in the previous 5 years?
 - **Updated Customer Portals:** What would be the cost and implementation timeline for updating your customer portals to track the number of outages experienced annually?
 - **Automated Outage Credits:** What would be the cost and implementation timeline for the development of a system to automate outage credits to customers?
 - How do you currently deal with customers that experience multiple interruptions within a major or catastrophic event?

Homework due by January 24, 2020:

- Wire Down Relief Comment:
 - “...In our line of work, sometimes we have to deal with deceased individuals, and over the years, when we have had the occasion to call the funeral home, two old guys in suits always show up in an hour or less to take care of the body. If two elderly gentlemen can get up in the middle of the night, put on a suit and tie, and respond to a scene in a timely manner, then the electrical company should be able to do it as well...”

Homework due by January 24, 2020:

- Wire Down Programs (utilities):
 - What would it take to meet the one hour relief standard requested by Fire Departments? Think of your worst event (windstorm)—how long would it reasonably take to reach the end of your territory to repair a wire?
 - How is your wire down program constructed?
 - Is wire guarding part of an employees normal job duties or is it voluntary?
 - How long is their standard shift?
 - How long is their training program? Do you information share/train with first responders as well?
 - Is wire down relief part of your official emergency response planning? How is it handled during an emergency or storm event?
 - Is it possible to have a 3rd party contractor assist your company in relieving the wires?

Homework due by January 24, 2020:

Take Two! In case you did not have a chance to reply to this due to the holidays or if you want to directly reply to any comments or ideas introduced into the docket comments, you can reply to these and label them “Session #1 Homework Reply”

- Comments (all):
 - Which standards do you think can be deleted?
 - Which standards do you think should be added?
 - Which standards are the most feasible to implement?
 - Which standards are the least feasible to implement?
- Meter inventory (utilities):
 - What style of meters are currently in the system? (i.e. analog, AMR, AMI, etc.)
 - What Style meters do you plan to have in the system beyond 5-years?

Comment Submissions

1. Written comments can be submitted to the docket by emailing mpscedockets@michigan.gov and referencing MPSC Docket No. U-20629.

2. Alternatively, comments referencing the specific docket can be mailed to:

Michigan Public Service Commission

P.O. Box 30221

Lansing, MI 48909

Upcoming Meetings & Deliverables

Upcoming Workgroup Meetings @ MPSC

- January 17, 2020 Workgroup #2 Homework Due
 - February 12, 2020 9:00 AM-4:00 PM
 - March 12, 2020 9:00 AM-4:00 PM
 - April 16, 2020 (tentative) 9:00 AM-4:00 PM
-
- Deliverables
 - April 30, 2020: Initial Report Due
 - Summary of Workgroups
 - Summary of Stakeholder Comments
 - May-August 2020
 - Stakeholder Review and Comment Period
 - September 1, 2020: Final Report Due

Contact Me

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Making the Most of Michigan's Energy Future

We're Adjourned!

Travel Safely!



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