MI POWER GRID

Making the Most of Michigan's Energy Future

Technical Standards for Electric Service Workgroup Meeting #2

U-20630

January 8, 2020

MPSC

Michigan Public Service Commission

Meeting #1 Recap

<u>December 3, 2019</u>

Background/Introduction

Parts of Standards

Multi-State Review

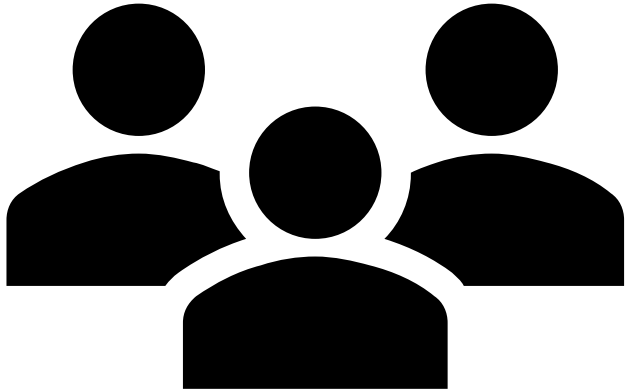
Staff Areas of Interest

Assignment (comments/meter type data)

Today's Agenda

Agenda Items		
9:00 am	Welcome, Introduction, and Background	MPSC Staff
9:15 am	Session #1 Comments Summary	Tayler Becker, Electric Operations Section
9:30 am	Technical Standards for Electric Service Staff Multi-State Review	Tayler Becker, Electric Operations Section
10:00 am	Cybersecurity Update	Brian Sheldon, Energy Security Section
10:30 am	Break	
10:45 am	Technical Standards for Electric Service Public Sector Consultants Multi-State Review	Eric Pardini, Public Sector Consultants*
11:30 am	Technical Standards for Electric Service: Areas of Focus	Tayler Becker, Electric Operations Section
11:45 am	Closing Statements, Next Steps, and Assignment	MPSC Staff
12:00 pm	Adjourn	

Meeting #1 Comments



Michigan Electric Cooperative Association (MECA) - Comments

- R 460.3410 – rule contemplates service extension plans to be approved by the Commission from a rate making perspective, but MECA members are not rate regulated by the Commission (delete)
- R 460.3411 – a number of Commission and court cases have been developed to provide clarity. Lack of compliant cases demonstrates that the utilities have a clear understanding of Rule 411. Changes that do not further the purpose should be rejected
- R 460.811 – R 460.815 should be incorporated into Technical Standards
- Digital metering should be accounted for in Parts 1 and 3
- Meter testing rules should be designed to take into account solid-state or digital meters which do not drift out of accuracy

DTE Energy (1 of 3) - Comments

- Supports alignment with “Technical Standards for Gas Service” and incorporating “Electric Supply and Communication Lines and Associated Equipment” rules pending a review (feasible to implement)

- Supports eliminating reference to billing rules (feasible to implement)

- Welcomes possibility of updating the extension service rules and incorporating cybersecurity requirements

DTE Energy (2 of 3) - Comments

- Supports Staff establishing a subgroup to evaluate metering ruleset changes (relatively feasible to implement)
- Meter location requirements are on webpage guide and respectfully requests clarification and intent
- DOE's definition should be used for "AMI"
- Would like to propose a definition for "serious injury" for a future workgroup session

DTE Energy (3 of 3) - Comments

- R 460.3504 (inspection program) – does not recommend specific O&M requirements related to preventative maintenance at this time. These are illustrated in distribution plans (U-20147)

- R 460.3505 (line clearance program) – notifications and audit processes for tree trimming are in distribution plan for ETTP which is where they are best suited

- Recommends establishing workgroups in area of meter requirement rules including a review of the read-rate standards for AMI, analog, and AMR meters

Consumers Energy (1 of 4) - Comments

- R 460.3411 (extension of facilities) – clarification provided through case law and Commission decisions which would be undermined by revisions (least feasible to implement)

- R 460.3504 (inspection program) – additional discussion and analysis needs to be performed to assess the feasibility of additional programs beyond overhead line inspection program (feasible to implement)

- R 460.3505 (line clearance program)
  - language should be updated from “tree trimming” to “line clearing.” “Tree trimming” does not include tree removals or herbicide treatments
  - 100% pre-trimming notice would be difficult and would undermine legality of easement rights (least feasible to implement)
  - 100% post-trimming audits would result in significant cost increases (least feasible to implement)

Consumers Energy (2 of 4) - Comments

- R 460.3604 (meter removal tests) - accuracy needs to be added to the testing language to be more specific

- R 460.3605 (metering electrical quantities) – remove obsolete electro-mechanical meter language and update net metering reference in (3)

- R 460.3606 - 3609 (meter requirements) – remove obsolete electro-mechanical meter language

Consumers Energy (3 of 4) - Comments

- R 460.3608 (demand meter requirements) - should be deleted
- R 460.3610 (voltmeter accuracy) – remove language pertaining to analog devices
- R 460.3613 (meter testing)
  - Remove obsolete electro-mechanical meter language for demand meters
  - Additional research needed to look at differences between ANSI/ASQC Z1.9 and ANSI/ASQC Z1.4

Consumers Energy (4 of 4) - Comments

- R 460.3618 (generating meter tests) – update to test generating meters every 24-months

- R 460.3701 (AC standard frequency) – eliminate “the satisfactory operation of customers’ clocks which are connected to the system” since very few clocks are synchronized to the grid. Consider NERC language for Eastern Interconnection between 59.5 and 60.5 Hz

- R 460.3702 (nominal service voltage) – costly upgrades would be needed if the range of acceptable variation was reduced

Michigan Electric & Gas Association (MEGA) - Comments

- R 460.3504 (inspection program) – allows each utility to create its own program based on the needs and experience of the utility which has worked well for utility companies that are all unique

New Energy Advisors - Comments

- Tracking and reporting of momentary interruptions should be considered with AMI and grid automation. Momentary interruptions have a real cost and may become important as utilities install equipment (reclosers and smart switches) to improve on sustained interruptions but increase momentary interruptions

- Creators of the Interruption Cost Estimate (ICE) calculator acknowledge the importance of accounting for momentary interruptions

Association of Businesses Advocating Tariff Equity (ABATE) - Comments

- R 460.3411 (extension of service)
  - Obsolete and has nothing to do “Technical Standards”
  - No clear statute to authorize customer constraints of rule
  - Should be eliminated in its entirety, if not, alternative amendments should be made such as:
    - revision of the definition of “customer”
    - elimination of (2), (7), (8), and (11)

Citizens Utility Board of Michigan (CUB) - Comments

- Supports Staff's recommendation to consider mandating that utilities submit annual safety reports of OSHA incidents, and injuries requiring medical attention or property damage

- Supports Staff's recommendation to consider requiring a report after each major service interruption.

Meeting #1 Meter Types

Michigan Electric Cooperative Association (MECA) (1 of 2) - Meters

- Presque Isle Electric & Gas
  - Currently: Electro-mechanical (analog), AMR (12), pilot AMI (20)
  - 5-year plan: 100% AMI

- MEC Electric
  - Currently: 100% AMR
  - 5-year plan: no changes

- Homeworks Tri-County
  - Currently: Electro-mechanical (analog) (11), AMI (1,171), AMR (26,072)
  - 5-year plan: no changes

- Cherryland
  - Currently: 100% AMI
  - 5-year plan: no changes

Michigan Electric Cooperative Association (MECA) (2 of 2) - Meters

- Ontonagon
  - Currently: 100% AMR
  - 5-year plan: 100% AMI

- Great Lakes
  - Currently: 100% AMI
  - 5-year plan: no change

- Thumb
  - Currently: 50% analog and 50% AMI
  - 5-year plan: 100% AMI by end of 2020

- Alger Delta
  - Currently: AMR
  - 5-year plan: 100% AMI by end of 2020

DTE Energy - Meters

Meter Type	Customer Class	Customer Count	Meter Count
AMI	Residential and Commercial	2.2 million	2.5 million
Digital Meters	Residential and Commercial (AMI Opt-Out)	7000	9000
Analog	Residential and Commercial	100	105
Industrial Meters	Primary Customers (Industrial and Primary Commercial)	4840	5950

Currently: AMI, digital, and analog

5-year plan: leverage AMI and replacing end-of-life meters with AMI as needed.
No specific plans for five years and beyond

Consumers Energy - Meters

Currently: AMI, digital, and analog

5-year plan: eliminate electro-mechanical

Meter Type	Quantity Installed 12/2019	Part of Meter Population in 2024
Smart Meters (AMI)		
Single-Phase Electric Smart Meters (AMI)	1,765,701	Yes
Polyphase Electric Smart Meters (AMI)	70,655	Yes
Legacy Meters (Communicating)		
Single-Phase Digital (Communicating)	5,415	Yes
Polyphase Digital (Communicating)	756	Yes
Legacy Meters (Non-Communicating)		
Single-Phase Digital (Non-Communicating)	5,415	Yes
Polyphase Digital (Non-Communicating)	756	Yes
Single-Phase Electro-Mechanical	5289	No
Polyphase Electro-Mechanical	5	No

Michigan Electric & Gas Association (MEGA) - Meters

- Alpena Power Company
  - Currently: 100% AMR
  - 5-year plan: no changes
- Indiana Michigan Power Company
  - Currently: analog, AMR, and AMI
  - 5-year plan: AMI adopted
- Northern States Power (WI Xcel)
  - Currently: 100% AMR
  - 5-year plan: AMI in 2024-2025
- Upper Michigan Energy Resources Corporation
  - Currently: AMR
  - 5-year plan: WPS – AMI; WE Energies – no change
- UPPCO
  - Currently: analog, AMR, and AMI
  - 5-year plan: AMR and AMI

Questions

Tayler Becker
Technical Standards Lead
Email: Beckert4@Michigan.gov
Phone: (517) 284-8236

MI POWER GRID

Making the Most of Michigan's Energy Future

Technical Standards for Electric Service Staff Multi-State Review

January 8, 2020

MPSC

Michigan Public Service Commission

State Selection Methodology

States that are precedent setting, in the Midwest, and experience extreme weather events

10 States Include:	
California	New Jersey
Illinois	New York
Indiana	Ohio
Massachusetts	Washington
Minnesota	Wisconsin

Topics Explored

1) Main elements of “Technical Standards”

2) Meter testing/accuracy requirements

3) Cybersecurity requirements

4) How technological advancements are being incorporated in standards

5) O&M requirements (preventative maintenance and tree trimming)

California Observations

- Extensive O&M requirements
  - Annual reporting of inspections
  - Inspection intervals
  - Record keeping
- Minimal metering requirements
- Minimal cybersecurity

Source: https://en.wikipedia.org/wiki/California

https://www.cpuc.ca.gov/generalorders/

Illinois Observations

- Extensive metering requirements
- Extensive vegetation management (non-emergency)
- No Cybersecurity requirements

Source: https://en.wikipedia.org/wiki/Illinois

http://www.ilga.gov/commission/jcar/admincode/083/083parts.html

Indiana Observations

- Extensive vegetation management requirements
  - Notice with notice media and content requirements
  - Various tree trimming standards
  - Customer education program
- No cybersecurity requirements

Source: https://en.wikipedia.org/wiki/Indiana

http://www.indianadg.net/wp-content/uploads/2015/11/170-IAC-4-Electric-Utilities.pdf

Massachusetts Observations

- Extensive vegetation management notification (Transmission only)
- Extensive emergency operations and reporting requirements – filing of Emergency Response Plans
- No cybersecurity requirements

https://en.wikipedia.org/wiki/List_of_municipalities_in_Massachusetts

https://www.mass.gov/info-details/220-cmr-department-of-public-utilities

Minnesota Observations

- Extensive reporting (incident, safety, meter reading performance, etc.)
- Minimal meter testing requirements
- No cybersecurity requirements

Source: https://en.wikipedia.org/wiki/Minnesota

https://www.revisor.mn.gov/rules/7826/

New Jersey Observations

- Extensive vegetation management requirements
- No cybersecurity requirements

Source: https://en.wikipedia.org/wiki/Outline_of_New_Jersey

https://advance.lexis.com/container?config=00JAA5OTY5MTdjZi1lMzYxLTQxNTEtOWFkNi0xMmU5ZTViODQ2M2MKAFBvZENhdGFsb2coFSYEAfv22IKqMT9DIHrf&crid=3f51640d-e526-467a-ac68-765b842c2b4b&prid=508b8f6b-eed6-4368-90c0-094885906595

New York Observations

- Advanced technology requirements (recording momentary interruptions, voltage sags, voltage swells, etc.)
- Extensive meter testing guidance
- Recent cybersecurity efforts

Source: https://en.wikipedia.org/wiki/New_York_(state)

http://www3.dps.ny.gov/W/PSCWeb.nsf/All/83026A47E9CCFBC485257687006F39CB?OpenDocument

Ohio Observations

- Advanced technology requirements (recording momentary interruptions)
- Extensive metering requirements
- Minimal distribution O&M requirements
- No cybersecurity requirements

Source: https://en.wikipedia.org/wiki/List_of_cities_in_Ohio

http://codes.ohio.gov/oac/4901%3A1-10

Washington Observations

- Extensive meter testing requirements
- Advanced technology requirements (smart grid report)
- Minimal cybersecurity requirements (smart grid report)

Source: https://en.wikipedia.org/wiki/Washington_(state)

https://apps.leg.wa.gov/wac/default.aspx?cite=480-100

Wisconsin Observations

- Extensive metering requirements
- No cybersecurity requirements
- Vegetation management requirements
  - Notification to landowners
  - Oak tree trimming

Source: https://en.wikipedia.org/wiki/List_of_cities_in_Wisconsin

https://docs.legis.wisconsin.gov/code/admin_code/psc/113

Conclusions: Topics Explored

- States meter testing and accuracy requirements are the most consistent, but do not always reflect modern meters
- States have minimal to no cybersecurity requirements
- States are starting to require additional information with technological advances and additional information from AMI
- States have more prescriptive vegetation management requirements
- States O&M/preventative requirements are not prescriptive

Conclusions: Beyond Topics Explored

- States have meter location requirements
- States require annual OSHA safety reports
- States have more prescriptive vegetation management requirements
- States have more prescriptive incident reporting requirements
- National Electrical Safety Code (NESC) is incorporated for design and installation of distribution systems

Questions

Tayler Becker
Technical Standards Lead
Email: Beckert4@Michigan.gov
Phone: (517) 284-8236

MI POWER GRID

Making the Most of Michigan's Energy Future

Cybersecurity Update

January 8, 2020

MPSC

Michigan Public Service Commission

Overview of Rule 205

- Title: “Security Reporting”
- Effective: January 9, 2019
- Requirements: Two-pronged
  - Provide the MPSC staff with a written or oral annual report about the utility’s cybersecurity program. *R 205(1)*
  - Notify the MPSC staff if the utility experiences a cybersecurity incident that meets one or more defined thresholds. *R 205(2)*

Staff Observations on Rule 205

- Generally positive feedback from utility stakeholders.
- Consistent with formal and informal efforts in other states and with guidance provided by NARUC, DOE, etc.
- Efforts underway to replicate Rule 205 for the Technical Standards for Gas Service (U-20608).

Staff not currently evaluating changes to the substance of Rule 205, but changes may be warranted for clarity.

Change #1 – “Electric Provider” vs. “Utility”

- All “electric providers” are subject to Rule 205, as that term is defined in *R 205(3)*.
- This definition differs somewhat from “utility,” as that term is defined in *R 102(n)*.
- Crux of stakeholder comment is “gas provider” could be interpreted to also encompass alternative gas suppliers. The same logic would apply to the term “electric provider.”

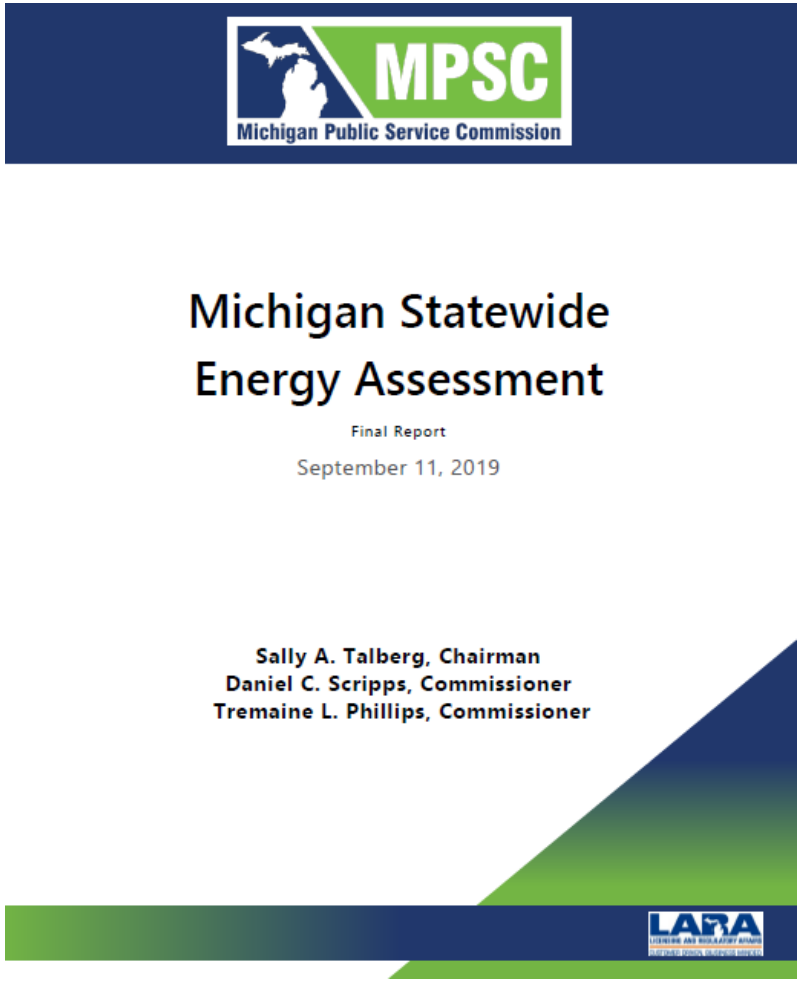
Change #2 – Reference to MI Data Breach Law

- Electric: "An unauthorized person accessed or acquired data that compromises the security or confidentiality of personal information maintained by the electric provider, as defined by section 3(r) of the identity theft protection act…"
- Gas: A security breach, as defined by section 3(b) of the identity theft protection act…"

Cybersecurity for Electric Distribution

Recommendation S-2:

"The Commission instructs Staff to continue to evaluate existing Commission rules and utility data privacy tariffs for opportunities to enhance the protection of customer data and the cybersecurity of electric distribution infrastructure."



Staff Goals for a New Cyber Rule

- ✓ Avoid conflicts across regulatory jurisdictions
- ✓ Broad applicability
- ✓ Built on best practices
- ✓ Flexible
- ✓ Balance the compliance/security tradeoff
- ✓ Avoid instant obsolescence
- ✓ Fit MPSC staff's capabilities and expertise

A Conceptual Framework – Part 1

- Requirement: Have procedures to accomplish a cybersecurity objective and follow them.
- Examples:
  - Respond to and recover from a cybersecurity incident
  - Identify and remediate software vulnerabilities

A Conceptual Framework – Part 2

- Requirement: Complete a specific cybersecurity task within a specified timeframe.
- Examples:
  - Conduct an assessment of the utility cybersecurity program's capabilities (annually)
  - Conduct employee phishing tests (quarterly)
  - Exercise your cyber incident response procedures (annually)

What might compliance look like?

- Attestation of compliance by a utility security official
- Commission could request a review of required procedures
  - Do they exist?
  - Were they followed?
  - Were they adequate?
  - What changes should be made?
- Commission could also request a 3rd party audit against this rule.

Next Steps

- Staff currently developing a straw proposal based on this framework
  - Timing TBD – February a realistic target
- Form a subgroup to collect feedback and work on language details
- Staff outreach w/ utility technical staff

Questions

Brian Sheldon
Cybersecurity Lead
Email: Sheldonb@Michigan.gov
Phone: (517) 284-8313

BREAK

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

Public Sector Consultants (PSC) is an objective, nonpartisan research and consulting firm based in Lansing and Detroit. Our services have been used to advance innovative solutions to difficult public policy challenges in Michigan and beyond for 40 years.

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.

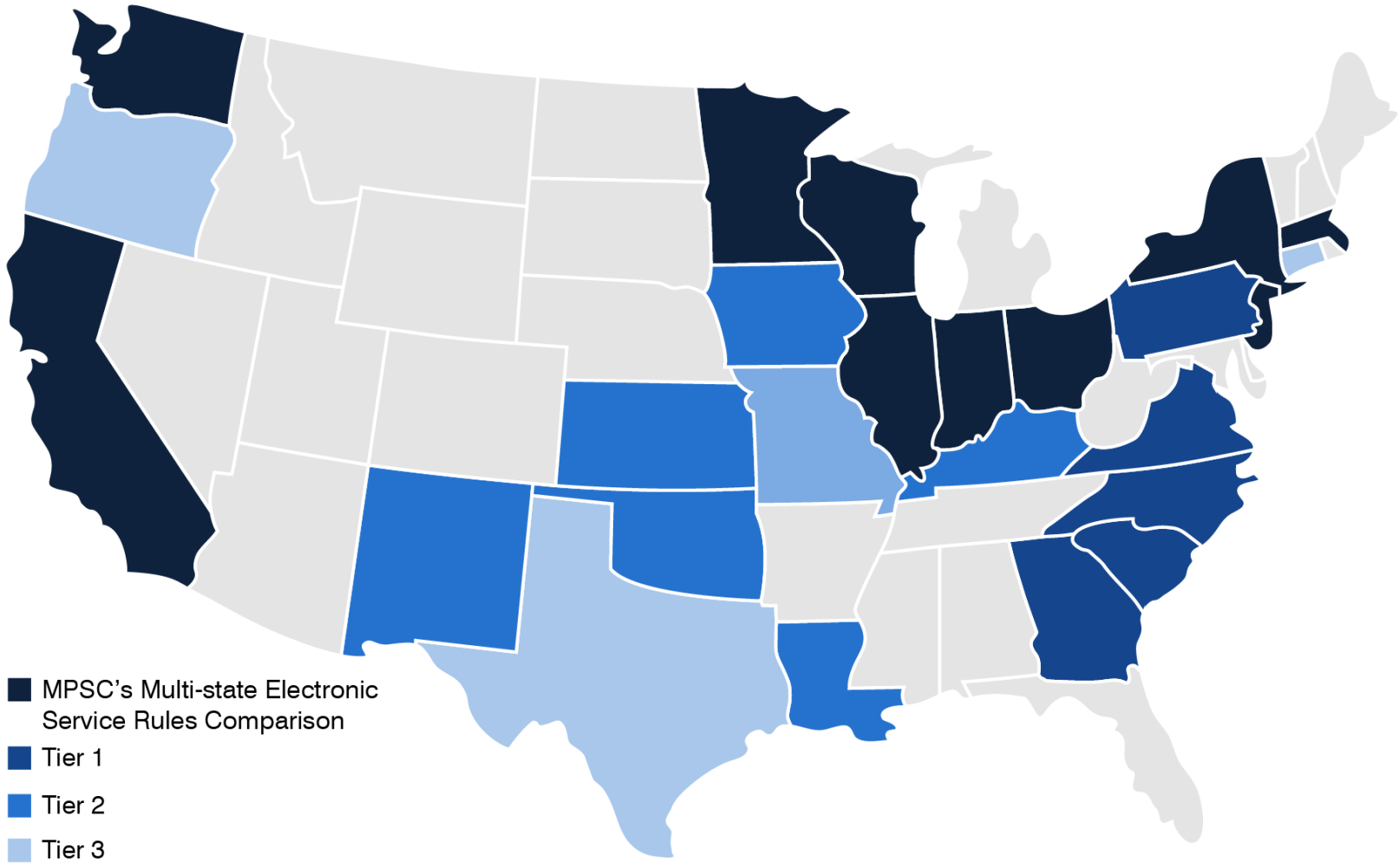
Selecting Additional States

- 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?


PSC
PUBLIC SECTOR
CONSULTANTS
PUBLIC SECTOR CONSULTANTS
@PSCMICHIGAN
PUBLICSECTORCONSULTANTS.COM

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 (MWhs)
- 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 (m^2 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 (m^2 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).

MI POWER GRID

Making the Most of Michigan's Energy Future

Technical Standards for Electric Service Workgroup Areas of Focus

January 8, 2020

MPSC

Michigan Public Service Commission

Workgroup Focus Areas

- ✓ Definitions (sustained interruption, momentary interruption, major interruption, planned interruption, serious injury, AMI/solid-state meters)
- ✓ Meter inspection, testing, accuracy, and location
- ✓ Cybersecurity
- ✓ Accident and incident reporting
- ✓ Vegetation management/operations and maintenance
- ✓ Advanced technology – additional information available with modern meters
- ✓ Rule 411 (extension of electric service)
- ✓ Standard frequency for alternating current systems

Additional Considerations

- ✓ Consistency with “Technical Standards for Gas Service”
- ✓ Billing rule amendments
- ✓ Incorporated Standards - reference instead of adding language
- ✓ Incorporate “Electrical Supply and Communication Lines and Associated Equipment” ruleset into “Technical Standards for Electric Service”

Proposed Additions

- Part 1 (General Provisions)
  - Update definitions
- Part 2 (Records and Reports)
  - Update to include reporting of OSHA accidents, preventative maintenance plans, major storm events, and emergency response plans
  - Update to include reporting of momentary interruptions
- Part 3 (Meter Requirements)
  - Update to reflect modern meters and include meter location
- Part 4 (Customer Relations)
  - Update to include meter location
  - Update to include R 460.3411 amendments

Proposed Additions Cont.

- Part 5 (Engineering)
  - Update to include cybersecurity requirements
  - Update to include more prescriptive inspection program requirements
  - Update to include additional vegetation management requirements
  - Update to include “Electrical Supply and Communication Lines and Associated Equipment” requirements (additional consideration)
- Part 6 (Metering Equipment Inspections and Tests)
  - Update to reflect modern meters
- Part 7 (Standards of Quality of Services)
  - Update to reflect voltage information obtained through advanced technologies
  - Update R 460.3701 to address the fact that very few clocks are synchronized to the grid
- Part 8 (Safety)
  - Update to include additional reporting of accidents and incidents

Assignment Due January 24, 2020

Submit comments on “Focus Areas”

- Specific language recommendations
- Specific considerations/suggestions
- Additional recommended “Focus Areas”
- Desire to participate in particular “Focus Areas”
- Information sharing offers (emergency response plans (ERP), preventative maintenance plans, etc.)

Comment Submittal

1. Written comments can be submitted to the docket by emailing mpscedockets@michigan.gov and referencing MPSC Docket No. U-20630.

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

Michigan Public Service Commission

P.O. Box 30221

Lansing, MI 48909

Looking Ahead

Next Workgroup Meeting

February 12, 2020 @ MPSC Offices

Questions

Tayler Becker
Technical Standards Lead
Email: Beckert4@Michigan.gov
Phone: (517) 284-8236

Brian Sheldon
Cybersecurity Lead
Email: SheldonB@Michigan.gov
Phone: (517) 284-8313