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June 29, 2017

VIA ELECTRONIC FILING

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

Re: Notice of Comment Period on Distribution Planning Efforts and Considerations
Docket No. E999/CI-15-556

Dear Mr. Wolf:

Minnesota Power hereby submits, via electronic filing, it's Reply Comments in response to the Minnesota Public Utilities Commission's ("Commission") Notice of Comment Period on Distribution System Planning Efforts and Considerations in Docket No. E999/CI-15-556 (or, Notice"). In the Notice the Commission outlines questions intended to seek information regarding utility planning operations. Attached are the Company's responses to the inquiries contained in the Notice.

Please contact me at the number above with any questions.

Sincerely,

Jenna Warmuth

JW:sr
Attach.

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

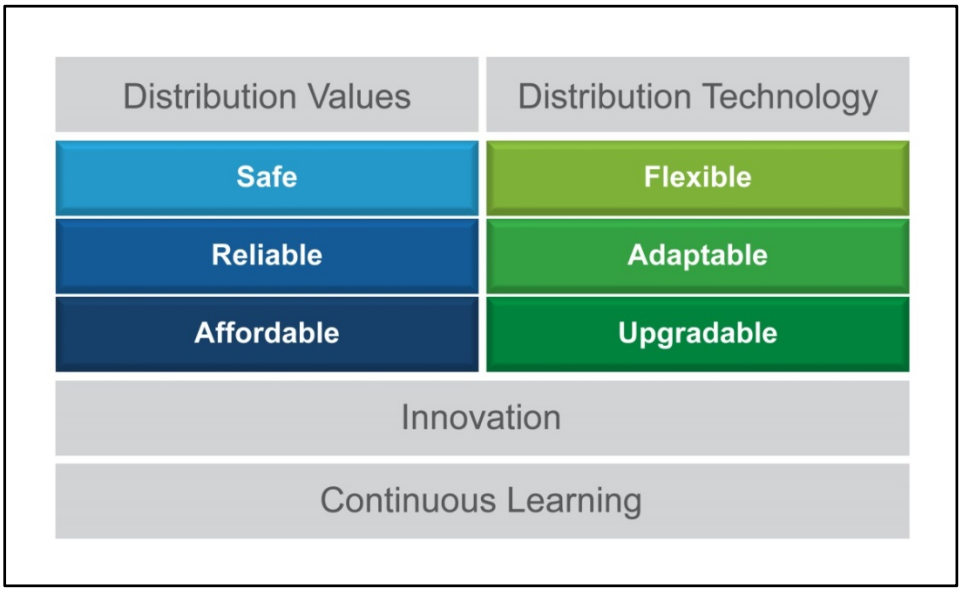
In the Matter of the Commission Investigation into Grid Modernization: Focus on Distribution System Planning	Docket No. E999/CI-15-556 **COMMENTS**

I. INTRODUCTION

On April 21, 2017 the Minnesota Public Utilities Commission ("Commission") issued a Notice of Comment Period on Distribution System Planning Efforts and Considerations in Docket No. E999/CI-15-556 (or, Notice"). In the Notice the Commission outlines questions intended to seek information regarding utility planning operations.

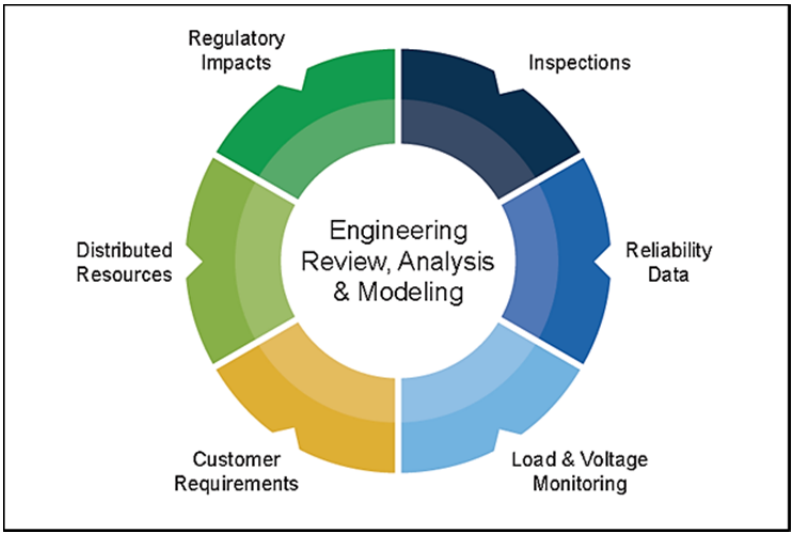
Grid modernization, which includes planning for, and building toward, a smarter energy infrastructure, is a top priority at Minnesota Power (or, "the Company"). It is driven by the need to upgrade the Company's electric distribution and metering systems; implement load control programs; and customer engagement strategies for improved reliability and energy efficiency, lower costs and more certain peak demand reductions. Minnesota Power's strategy is focused on small-scale smart grid investments in key areas to first test the efficacy of technologies and systems and then scale-up when cost-effective solutions are verified.

Minnesota Power has positioned itself well for the emerging trends and changes coming in all areas of its business, including both accommodating and incentivizing increased presence of Distributed Energy Resources ("DER") on its system. The Company must navigate these changes while keeping its core tenets of safety, reliability and affordability for its customers in the forefront. In addition to the current strategic positioning, Minnesota Power has encouraged collaborative stakeholder development through the regulatory process to ensure fair and balanced policy.



While looking toward the future in meeting the needs of its customers and planning for new technology and innovation in its distribution system, the Company must also balance its initiatives with the realities of its customer mix and the region's capacity for DER and grid modernization investment. Most of Minnesota Power's service territory is rural.[1] In Saint Louis County, Minnesota, for example, where Minnesota Power's largest city, Duluth (population ~80,000) is situated; the median household income is approximately $47,000 per year. The median income by county in Minnesota Power's service territory ranges from around $43,000 to $53,000. This is in contrast to more urban, metro-area counties, where annual median incomes range closer to $75,000 - $85,000. These geographic, customer demographic, and economic considerations necessitate an approach to grid modernization investment that matches customers' interests and economics.

Minnesota Power continues to focus on providing reliable and low-cost energy, while making prudent technology investments to enhance customer experience and reliability. Central to this customer compact is the distribution system planning process which guides investments on the system. All system investments must be weighed by cost, number of customers served, and practicality of expected results. The distribution planning process to-date has followed a very traditional model for Minnesota Power, taking into consideration load growth, system age, reliability statistics, customer needs and regulatory objectives looking through a specific project planning continuum on a rolling five-year basis, with a larger system-wide outlook subject to a 10 year planning window.



Minnesota Power has a longstanding history of working with its customers on the implementation of innovative DER. From backup power supply options to the newest solar technology, the Company is continuously monitoring the emerging trends of technology and its customer requirements. Minnesota Power is pursuing distributed energy resources that are consistent with its current Energy***Forward*** resource strategy, which is designed to deliver safe and reliable service at the lowest possible cost to customers while protecting and improving the region's quality of life.

[1] http://www.census.gov/quickfacts/table/IPE120214/27137

Minnesota Power has consistently worked on process improvement and optimization of the interconnection of DER. This optimization required a change in philosophy with regard to planning, in that distribution system planners must now work to find locations where distributed energy resources can not only be accommodated, but when they can enhance system reliability and possibly improve the economic operation of the system.

The DER interconnection process is one of the more complex interactions that Minnesota Power has with customers, as it requires coordination between the customer, manufacturer, installer, inspector and the Company. Minnesota Power has dedicated Renewable Programs professionals and education tools to continually clarify and streamline the interconnection process. By enhancing customer communication efforts, Minnesota Power is helping to align customer expectations with achieved results. These efforts will aid in ensuring that distributed generation ("DG") systems continue to be installed in a safe and reliable manner.

II. RESPONSES TO TOPICS OPEN FOR INITIAL COMMENT IN SECTIONS A AND B OF THE NOTICE

Section A

1. *The distribution planning resources utilized by utilities, including:*

   a. *Types of modeling software used and for what specific purpose:*

      Minnesota Power currently utilizes Windmil[2] to model for system planning and operations. The Company also utilizes Sincal[3] on a limited basis while it works to get Windmil fully operational for modeling purposes.

   b. *Applicable engineering standards*

      The distribution system is designed to exceed the minimum requirements of the National Electrical Safety Code ("NESC"). The NESC specifies clearances above grade, installation requirements for underground systems, grounding, structure strength, work rules, and operating practices to provide for the safeguarding of the public and utility workers. The electric supply system is designed and operated to maintain delivery voltages within the limits established by American National Standard ANSI C84.1-1982, Range A. Temporary and infrequent conditions may result in operating voltages outside of these limits (ANSI C84.1-1982, Range B).

   c. *Personnel commitment: including utility personnel as well as contracted services and an overview of their roles and responsibilities*

[2] https://www.milsoft.com/utility-solutions/upgrades/milsoft-engineering-analysis-ea-windmil%C2%AE
[3] https://www.energy.siemens.com/nl/pool/hq/services/power-transmission-distribution/power-technologies-international/software-solutions/pss-sincal/Brochure_PSS%20SINCAL_EN_S4.pdf

Minnesota Power has one FTE (full-time equivalent) and various supportive services dedicated to distribution system planning at this time. The Company does not currently utilize any contracted services for distribution planning system purposes.

d. *System visibility and data availability: At what circuit levels and over what time intervals is data collected? If possible, provide an example of the range of data collected and available.*

Feeder level loading data is collected where the proper metering/sensor infrastructure is currently installed. Data quality, granularity, and availability vary widely across different parts of the system. For small stations, the peak demand is collected monthly. For large stations, the Company utilizes real time load monitoring. Typically, the published internal reports only utilize monthly peaks.[4] Meter data is collected and recorded for all primary voltage distribution substations and circuits.

e. Percentage of substations and feeders are equipped with SCADA

Roughly 30 percent of the Company's systems report through SCADA.

f. Form of hosting capacity software or analysis, if any, used in the planning process and to conduct interconnection

Minnesota Power currently does not have any in-house software that can perform hosting capacity analysis. The Company has not extensively explored the cost of software on the market to perform such an analysis. At this juncture, Minnesota Power would most likely need to contract services to perform a hosting capacity study. General knowledge suggests that contracted services for a study of this nature could run in the magnitude of millions of dollars.

2. An overview of planning schedules and process, including:

a. *Frequency in which the utility conducts distribution system planning*

The distribution planning process to date has followed a very traditional model for Minnesota Power, taking into consideration load growth, system age, reliability statistics, customer needs and regulatory objectives. Minnesota Power maintains a specific project planning continuum on a rolling five-year basis, with a larger system-wide outlook subject to a 10 year planning window.

b. *Frequency of planning updates or revisions: Are updates dependent on a set timing frequency (i.e. every 2, 5, or 10 years) or are there events that may trigger a more frequent planning cycle or revision? If so, please explain*

Minnesota Power evaluates progress of the distribution plan on an annual basis. Distribution planning is dynamic and quick changing; therefore priorities do shift within the planning horizon. However, the Company would not make a wholesale change to the overall plan unless significant deviations in capital were to occur.

[4] Example of this data is included as Attachment A to these Comments.

c. *Iterative updates and/or new plans: Are planning processes based on continuations of past plans, new planning cycles, or some combination? How long is each planning cycle's time horizon?*

Each plan builds on another and multi-year projects are considered in the five-year plan. As stated previously, the plans as a whole are reviewed on an annual basis.

d. *Planning elements or considerations included (or not included) in regular updates and revisions and a description of each: For example: circuit or substation data, power flow analysis, power quality analysis, fault analysis, load and demand forecasts, external policy and regulations, etc.*

Minnesota Power does some circuitry loading forecasting and power flow analysis. These are not generally utilized to create or adjust the five-year plan. Minnesota Power relies upon system knowledge and experience to make decisions on what projects are included in the planning periods.

e. *Integration of existing planning processes: Explain to what extent existing planning processes, including resource planning, transmission planning and others studies (i.e. interconnection) are used in the formulation of distribution plans.*

Distribution Planning has worked to integrate with the Company's Transmission Planning Group to further enhance collaboration, leverage technical expertise, and increase support of Distribution Planning functions.

f. *Timing of associated distribution system budgeting processes: Is distribution system budgeting performed on an annual basis or on some other schedule?*

Distribution budgeting is performed in Quarter 1 and Quarter 2 on an annual basis.

g. *Process of developing capital budgets for distribution infrastructure?*

The Company uses a process in which collaborative meetings are held with all area engineers to discuss system needs. A list of projects is then created and prioritized and filled into the 5-year planning cycle based on its priority and evaluation score, with consideration given to available capital spend.

h. *Process for developing operating budgets for distribution operating changes or projects?*

The biggest driver in developing the Company's operating budgets is labor. The Company sets blanket targets for labor resources on an annual basis in conjunction with the capital spending plan.

3. *Demand and system loading forecast methodologies, including:*

   a. *Granularity of load forecasting: To what extent is the collected system data reflected inload forecasts; e.g., does the utility employ an 8760-hour forecast at the substation level?*

      Minnesota Power's long-term forecasts are produced with a "top-down" approach, where total system load is modeled and projected in aggregate. The short-term forecasting process (e.g. Day-Ahead, Week-Ahead) is more granular. Short-term forecasting uses customer-specific load estimates for large industrial customers and then projects the remainder in aggregate. The day-ahead projection of solar output for the Company's largest single installation (10 MW) is netted from the load forecast.

      At this point, the Company is not leveraging substation or other granular load data to produce load forecasts outside of some occasional and very specific location specific planning applications.

   b. *Use of company-wide peak forecasts versus aggregation of substation or other circuit-level peaks: Does the utility use a top-down forecasting approach versus a bottom-up approach, or some combination of these approaches?*

      The Company's long-term forecast approach is entirely "top-down."

   c. *Comparison of actual asset loading against past forecasts: Does the utility employ backcasting or ex post true-up to assess the accuracy of its forecasting process?*

      Minnesota Power's distribution engineering group produces an annual substation load report that forecasts growth and loading on transformers and the feeder level where the metering infrastructure and data is available. The forecasted peak is plotted against the measured peak to visually determine the accuracy of the forecasted loading and growth rate.

   d. *Minimum load assessments and forecasts: Does the utility utilize minimum load to assess potential impacts of distributed generation on power flows? Are minimum loads measured during peak hours or during night hours?*

      Minimum feeder and substation loading is considered when evaluating the impacts of DG. If solar is being analyzed, the minimum load value used is a daytime minimum load, the minimum found during the hours of 10AM-2PM. The actual minimum load would be used for other resources that could potentially be generating/producing close to nameplate capacity at any hour.

   e. *Impact on load forecasts of the projected availability of DER: How is utility forecasting impacted by utility assessments on adoption and penetration of DER?*

      The Company is still evaluating the best approach to forecasting the adoption of DER on its system. Current system saturation on Minnesota Power's system of distributed

generation and energy resources is very small, as outlined in Section B, question 4 of these Comments.

4. Capital investments and operational projects

a. Assessment criteria and assessment process for feeder and substation reliability, condition of grid assets, and asset loading

Minnesota Power continuously reviews all distribution investments and incorporates thoughtful and prudent modernization investments while still holding true to the core values that have sustained the Company for more than a century: safety, reliability and affordability. Most modernization improvements begin with analysis based on a foundation of data that has been collected through many of the information management systems in which the Company has invested. The capital utilized in modernization activities can generally be broken down into two specific categories:

- Operational Technology ("OT") – Replacement of existing assets with modern asset designs that incorporate solid state components, sensors and communication technology to provide visibility, connectivity and data streams to system operations (i.e. AMI (advanced metering infrastructure), voltage monitors, intelligent switches).
- Information Technology ("IT") – Software and OT interface investments that allow for storage, reporting, and utilization of data and information in operations.

The confluence of these technology investments, combined with a customer-centric view, allows for prudent evaluation based on an ever-expanding foundation of data and information. This can provide more confidence in load research, modeling and forecasting as it provides more samples. This data can be used in rate design, class cost of service studies, new product offerings, etc.

The keys to successful implementation of capital are the specific project execution plans, project metrics, cost, and anticipated vs. actual benefits derived from the modernization investments. Due to the nature of the uncertainty around the realization of potential benefits of modernization investments, the approach has been to target pilot-scale projects that incorporate optionality and scalability. This approach has yielded some tremendous benefits, including much more seamless integration of DER, due to both OT and IT investments that speed the process by which interconnection to the distribution system takes place.

b. *Alternative analysis protocols for identified needs:*

i. *Capital versus operating solutions: How does the utility determine whether an assessed need is best met through a capital project or through operational solutions?*

A combination of factors is used for assessment of upgrade needs throughout Minnesota Power's system. Reliability is tracked by feeder and substation, with both SAIDI (System Average Interruption Duration Index) and SAIFI (System Average Interruption Frequency Index)calculated on a feeder-by-feeder basis. Reliability, along with asset age, asset types installed on both the feeder and in the substation, and trending of loading conditions, are all utilized as part of the analysis for capital projects. Generally, the system reliability is related to both age and the types of assets on a given feeder or substation and capital planning closely ties to these two factors.

ii. *Near-term versus long-term: Similar to the question above, with the additional factor that some less expensive capital projects may provide a shorter term solution than more comprehensive projects; how does the utility compare these alternatives?*

From a planning perspective, the goal is to provide the overall lowest cost of ownership with any asset investments. As a result, the entire lifecycle of the asset is taken into consideration at the time of purchase, particularly for those assets that require routine maintenance; such as switches, regulators, breakers, and reclosers. The optimal solution is one that provides the least operational costs over the life of the asset with the most reasonable capital cost. Much of this decision making is made through past experience and use of asset management systems that provide data for informed decision making for replacement of major assets. For those assets that contain solid state controls, or electronics, this reduced lifespan and costs (upgradability/flexibility) must also be taken into consideration as the control equipment will need to be upgraded far before the end of its useful physical asset life.

iii. *Non-monetized benefits: Apart from reliability and other traditional planning criteria, are other benefits (e.g., economic development, emission reduction) taken into account in considering alternative approaches to resolving system needs?*

Most capital projects are targeting a long-term lifespan for a given solution. Where budgetary constraints come into play, rather look at shorter-term solutions, the Company's distribution planning group will look at scalability and phase projects over several years. Given that the main challenge and majority of

spend is related to aging assets and specific asset types (of certain vintages), this is a much more preferable approach.

iv. *Non-wires-alternative (NWA) versus traditional solutions: Does the utility consider the potential for DER or other non-wires solution to address an assessed need, to defer or eliminate the need for a traditional capital or operating solution?*

This is not currently taken into consideration as part of the planning process.

v. *Assessing DER or NWA alternatives: What criteria or metrics are in assessing whether a DER or NWA can meet an identified need?*

Evaluation of NWA in lieu of many of traditional utility solutions only comes into play on a very small number of the Company's projects. As a result, they are generally not considered other than in special cases where there is a possibility that they could provide value.

vi. *Scenario analysis: In developing solutions to an assessed need, does the utility consider multiple scenarios, including factors such as load forecasts and DER penetration? If so, what scenarios are standard?*

Scenario analysis generally requires an understanding of the peak load and the load profile. Solutions are determined by modeling the existing system and then making changes to the model, if needed, to provide the capacity to serve within an acceptable voltage range for all conditions. Currently, the number, size, and density of DERs on the system is so small that it does not have any impact on the model. This could change in the future with more or large DER installations.

c. *Metrics for deciding among competing proposals: For any of the applicable categories described above, what specific metrics are used to conduct a comparison of alternative solutions? Are there examples of cost benefit studies or reports the utilities have conducted that can be provided with the responses?*

The most common and significant metric is cost. Distribution planners and engineers compare alternatives and make selections to provide the most economical solution. The solution must provide safe and reliable service. Cost benefit studies are common for transmission system improvements but not for distribution. Distribution design alternatives are typically more obvious and straightforward than transmission and do not require further analysis beyond selecting the most economical design that can provide the capacity to serve existing and future load if growth is forecasted.

d. *Historical distribution system spending: Please provide historical spending over the past five years for capital projects, operating changes or projects, information technology, communications and shared services.*

5 Year Distribution Capital Spending History					
	x $1000				
	2012	2013	2014	2015	2016
Distribution Engineering- lines only (SRSQ)	17,002	18,958	18,995	19,809	19,745
All including lines, bulk delivery stations, meters, facilities, security, IT, communications, and fleet	27,103	29,501	29,499	30,185	39,523

Distribution Operations & Maintenance Spend					
Actual Spend 2012-2016*					
	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Actual
Distribution**	18.5	18.67	20.88	19.88	24.75
*Reflects O&M data related to our Distribution operating departments at the Responsibility Center level, excluding labor overheads.					
**Denotes Distribution LOB without Fleet or Stores and includes expenses for Vegetation Management and all Storm Costs.					

5. *Locational assessment of DER in long-term planning*

a. *Describe how the utility uses analytical criteria for assessing potential alternatives to capital and operating improvements during the planning process, if at all, including:*

i. *Locational DER assessments: Whether locational DER assessments are a part of the planning process or if a DER solution is only considered once a need has arisen*

Currently, Minnesota Power includes demand side alternatives into its Integrated Resource Planning that include demand side response programs, and small generation sources. As these alternatives become economic as part of the broader Integrated Resource Plan optimization process they are included in the go-forward strategy for implementation. A recent example of this is the Back-up Generation program that was included in Minnesota Power's 2015 Integrated Resource Plan Short Term Actions, this program is now working through the implementation process as part of the Company's current Rate Review.

ii. *Time sensitivity of the system need: Does the system allow time to develop a potential DER solution? Are there short term traditional projects that can address imminent needs while a longer term DER solution is considered?*

Minnesota Power's Integrated Resource Plan and distribution planning process is based on proactive and forward-looking evaluations. The planning process does allow time to consider potential distributed energy resource alternatives.

b. *Where DER or non-wires alternatives are on par with traditional projects, based on the analytic criteria described above, is there a mapping of those geographic areas in which DER could replace or defer specific capital or operating projects?*

Currently, Minnesota Power has not identified projects where this dynamic exists and DER/non-wires alternatives provide benefits on-par with traditional projects, specifically for project replacement. Thus, there is no mapping of these areas.

6. *Security*

a. *What controls and processes are used to secure consumer and system data, IT/communication systems, and physical infrastructure?*

All Minnesota Power cyber assets (including data and customer information) fall under ALLETE Information Protection policies. Critical physical infrastructure falls under ALLETE security policies that are also driven through FERC, (Federal Energy Regulatory Commission), NERC (North American Electric Reliability Corporation) and US Coast Guard regulatory requirements. Information Systems, data and physical infrastructure are protected through a "defense in depth" strategy (based on the CIS Critical Security Controls framework – formerly known as the SANS 20 Critical Security Controls), good sound physical security practices and methodologies performed and shared through Department of Homeland Security (DHS) and Department of Defense (DOD). Policies and procedures are in place to address classification of data, physical and electronic access security (access based on business need), backup/recovery, malware protection, remote access, and disposal/redeployment of cyber assets. Minnesota Power also employs technologies to continuously monitor and alert on network and computer activities. Critical physical infrastructure (such as substations and corporate data centers) is alarmed with both security and environmental sensors and surveillance cameras that are monitored through a 24/7 ALLETE Emergency and Security Operations Center. In addition, personnel receive annual cyber security training and more frequent ongoing security awareness trainings. The Company also conducts periodic internal and external audits and assessments of cyber and physical vulnerability risks.

b. *What protocols and cooperative arrangements with NERC, NIST or other entities are used to identify threats and available defense measures?*

Minnesota Power and ALLETE Security personnel (IT and Physical) partner with numerous external entities to receive threat intelligence and defense measure updates. These include NERC E-ISAC, US-CERT, ICS-CERT, ESCC Cyber Mutual Aid, EEI, SANS, FBI, DHS (to include HSIN and Tripwire portals), US Coast Guard, US Corp of Engineers, MN HSEM, MN Fusion Center, regional and local sheriff's offices and city police departments, and 20+ real-time threat feeds going into the Company's IT Security monitoring tools. Minnesota Power is an active participant in the North American Transmission Forum (NATF), Mid-Continent Compliance Forum (MCCF), North Central Electric League (NCEL/NCEA), Minnesota High Tech Association and attends numerous other security oriented webinars and conferences annually. ALLETE IT Security Personnel have attended the DHS ICS-CERT Industrial Control Systems Cybersecurity (Red Team/Blue Team) Training through Idaho National Labs. In the event of an identified threat, Minnesota Power and ALLETE security personnel will further analyze the situation and implement applicable cyber and/or physical security plans related to prevention, protection, response and mitigation measures. The Company's processes and efforts correspond with various recognized and established programs, such as, CIS Critical Security Controls framework (cyber), DHS sub-sector security (physical) and NERC Security Response guidelines (physical).

Section B

1. *The date initiated, completed, and the planning timeframe used: For each planning component, the number of years to which it is applicable should be specified.*

   As previously stated, distribution capital planning and budgeting occurs on an annual basis. The planning begins in early January and by the time the capital plan is finalized it is often April or May. Distribution currently maintains an annual execution plan, a five-year detailed capital budget and a 10-year forecast with high-priority project needs.

2. *Scenarios: the range of any scenarios that were considered should be identified, e.g. high/low load forecast, high/low DER penetration*

   Projects within the capital plan that address capacity-related needs are based on high load forecasts for the project area. Minnesota Power does not currently consider any DER penetration scenarios during capital budgeting as the penetration level on Minnesota Power's system is very low. Future development of large scale DER would be included in the planning process if this happens.

3. *System constraints and needs:*
   a. *At a high level, what system constraints and needs are anticipated to develop or occur within the planning period? (Further detail is requested below)*

System constraints are generally determined by existing capacity. Because historic distribution load growth in recent years is low (< 0.5%), very little capital investment in capacity projects is needed. The largest single driver for capital projects is age-related asset renewal.

b. *How have these constraints and needs been prioritized based on assessment criteria, time sensitivity, budget impact, or other criteria?*

Priorities are determined by the best economic choice to provide capacity, reliability, and service quality, address government mandates, and replace end-of-life distribution plant. All projects are prioritized including the following rating factors: safety, reliability, efficiency, compliance, and rate impact.

4. *The current and forecasted extent of DER deployment by type, size, and geographic dispersion*

Small Scale Photo Voltaic ("PV") Systems:

As of the end of 2016, there were 184 DG solar customers with systems under 40 kW and 2 customers with systems sized 40 kW to 1 MW in Minnesota Power's service territory. Minnesota Power has provided customers with tools and resources to make informed decisions about their investments in renewable energy for over a decade. Installing a solar PV system requires collaboration between many different parties including customers, solar installers, inspectors, building and city officials, the utility and more. There are numerous components to a successful solar installation, the most important of which is the customer experience.

PV Solar Gardens:

A PV solar garden is a larger solar installation that is owned by a community or multiple subscribers. Typically these are connected to the distribution system and are generally larger than a single customer installation. Since it is a utility managed interconnection, operation of the system around these installations tend to be well controlled and subsequently easier to integrate.

Utility Scale Solar:

In 2016, Minnesota Power completed its first large scale solar project at the Camp Ripley Army National Guard Base near Little Falls, Minnesota. The 10 MW solar array, which was completed under budget, went in service in November 2016 and is now expected to produce nearly one third of the energy required for the Company to meet the SES.8 Site restoration of the nearly 80 acres of land used by the Camp Ripley Solar Project included native pollinator-friendly plant species.

In the Commission's July 18, 2016 Order Approving Minnesota Power's Integrated Resource Plan with Modifications, the Company was required to add 11 MW of solar by 2016, 12 MW of solar by 2020, and a final 10 MW of solar by 2025 to meet its solar energy standard ("SES") obligations. The Commission also noted that it found up to 100 MW of solar by 2022 potentially an economic resource for Minnesota Power's system, and ordered the Company to address the economic feasibility of more solar in any additional competitive acquisition processes.

Microturbines (gas or propane fired):

Microturbines are small, commercial sized combined heat and power generators that produce electricity and heat. There are currently 70 kW units at both Fond Du Lac Tribal and Community College and at the Western Lake Superior Sanitary District ("WLSSD"). WLSSD operated two turbines for nearly a year, but due to impurities in the waste gas used for their operation, they were subsequently taken out of service. A single 70 kW unit at the Fond du Lac Tribal and Community College was installed in 2006. No other microturbines are known to exist on Minnesota Power's distribution system.

Battery Storage:

Over the last few years Minnesota Power has seen an increase in the installation of battery backup systems by customers who want or need battery backup for systems within their homes. Several Minnesota Power customers have installed batteries to store energy for periods of solar PV inactivity. While battery technology is not frequently seen on a home with normal electrical load, the systems have been successfully installed in remote locations and offer an option for locations where standard utility service is impractical or cost prohibitive.

DG: Micro-wind Turbines:

Micro-wind turbines are small wind turbines that can be erected on residential and/or small commercial property. Since 2003, sixteen Micro-Wind Turbines have been installed on the Minnesota Power system with turbine sizes ranging from 1.8 kW – 20 kW. The total installed capacity of Micro-wind turbines on the Minnesota Power System is 192 kW.

5. *Currently planned distribution capital projects and operating changes, including:*
   a. *Capital and operating budgets over the applicable planning period, and to the extent possible, breakdowns of categories of expenses and budgets*

      As communicated in Section A, 4(d) of these Comments, the average capital spend on the distribution system has ranged from approximately $30 million in 2015 to $39 million in 2016. However, this includes all spend on facilities, fleet, meter, and bulk delivery stations as part of this total.

b. *Where individual budget categories contain a substantial increase or decrease from historical levels, please explain the rationale for the change*

Most areas of substantial increase are related to facilities projects (roof replacements) and bulk delivery distribution substation moves/additions as a result of either age or externalities that caused the increased investment. As indicated in 5(d), the few areas where it has been considered as an alternative, DER is generally the highest cost alternative with age related replacement and is quickly excluded from planning as a result.

c. *Any analysis of alternatives, mitigation, or deferrals of capital or operating projects that were conducted*

The overwhelming majority of projects related to our Distribution Capital plan did not provide a logical opportunity to perform an analysis of alternatives/mitigation/deferral as this majority of investment was age/condition related replacement.

d. *Identification of any future capital or operating projects that could reasonably be considered for substitution, mitigation, or deferral using DER alternatives*

The Company believes that no specific projects in the five-year planning period could be reasonably or economically mitigated or deferred using a DER alternative solution based on the age-related nature of most of the projects in the plan. DER is generally the highest cost alternative when examining solutions to age-related replacements.

e. *Identification of any non-monetized benefits of planned projects*

Generally, the largest non-monetized benefits of planned projects, specifically in the Distribution Asset area, are reliability benefits. Updated protection schemes and the potential for automated switching to alternative sources is the biggest benefit. The other major non-monetized benefit with many of the Company's projects is increased information as the Company replaces some assets with more advanced asset types. This is particularly relevant in our bulk delivery areas and automated switches. This additional situational awareness can provide much more insight into specific system operation and post-event analysis on the system.

f. *Identification of any projects that will enhance the company's future ability to integrate DER into system operations*

Any capacity-related project and or new substations could enhance the ability of the system to integrate DER since these projects often result in an upgrade to transformer capacity. The Company's ongoing AMI project is also a key component to enhance the integration of DER into operations due to the function of the metering devices and situational awareness of their impact on the system.

g. *Identification of any other projects, or investments, not specifically identified pursuant to (f) above, that support grid modernization as defined in the Staff Report on Grid Modernization (March 2016)*

The following projects are all proposed and may not be funded depending on the Company's priorities throughout the planning period.

- Duluth 14kV Automated Feeders: Minnesota Power plans on installing more intelligent switches around the Duluth area to increase reliability and allow for automatic restoration of the distribution system.
- Upgrade capacitor banks and controls: Minnesota Power plans on implementing a robust distribution capacitor bank asset management program in an effort to ensure that the capacitor banks employed on the distribution system can be used for future volt-var optimization efforts as well as maintaining acceptable voltage in the areas where the capacitors are installed.
- Baxter 531 Automation: Planned installation of smart switches in Western division.
- Long Prairie Loop and Automation: Minnesota Power plans on creating a 34kV loop in the Long Prairie area and then installing smart switches on the loop to increase reliability and enable automatic restoration in the area.
- Little Falls 12kV automation: Installation of smart switches in the Little Falls area to increase reliability and enable automatic restoration.

III. CONCLUSION

Minnesota Power appreciates the opportunity to provide clarity on the Company's current processes and procedures surrounding distribution system planning. Planning for the ever-evolving world of DER and technology related issues is a complex and somewhat novel practice. There has recently been a critical shift in planning focus from ensuring reliability to an increased concentration on resiliency. Public policy goals for the 21st century include clean power, innovative DER, advanced customer options and a more consumer-driven business model. The Company remains dedicated to providing safe, reliable and affordable energy to all of its customers, while also being responsive to new customer interests and evolving public policy goals.

Dated: June 29, 2017

Respectfully submitted,

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Substation and Feeder Loading data (kVA)

Substation	Feeder	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13
Colbyville	**240**	7651	7556	7077	6886	6695	8799	5165	6504	7556	4685	6982
	241	4113	3921	3539	3347	3539	4208	3252	5069	2487	669	956
	242	6121	6217	5643	5930	5356	11572	9181	5738	6217	3060	4113
	244	5930	5451	4782	4686	4495	4113	1435	3252	4208	1435	2200
	245	4208	3921	4399	3921	4208	5643	1148	1243	1339	861	1243
Substation Totals		**28023**	**27066**	**25440**	**24770**	**24293**	**34335**	**20181**	**21806**	**21807**	**10710**	**15494**
Hoyt Lakes	**1**	563	554	576	553	550	571	574	522	798	527	628
	2	2248	2100	1934	1820	1784	1662	1747	1900	2520	1874	2101
Substation Totals		**2811**	**2654**	**2510**	**2373**	**2334**	**2233**	**2321**	**2422**	**3318**	**2401**	**2729**
Barnum	**6421**	2189	2131	1872	1786	1512	1426	1800	1670	1858	1584	1814
Substation Totals		**2189**	**2131**	**1872**	**1786**	**1512**	**1426**	**1800**	**1670**	**1858**	**1584**	**1814**

Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
8512	10520	10329	9373	8321	6886	5547	4973	6121	4782	5547	6121	8703
1626	3060	3252	2391	1817	1626	1530	5643	3443	1722	1626	1722	3347
5547	8225	6886	6408	5834	4208	2104	2200	2774	2295	2487	2774	4686
3060	4304	4017	3539	3347	2295	2008	2104	2869	1626	1722	2008	3443
1052	1243	1148	1243	1052	1052	1243	1243	1435	1148	1148	1052	1052
19797	**27352**	**25632**	**22954**	**20371**	**16067**	**12432**	**16163**	**16642**	**11573**	**12530**	**13677**	**21231**

670	571	576	576	541	520	520	555	578	447	665	629	670
2444	2555	2428	2297	2050	1832	1832	2383	2499	1394	1898	2100	2443
3114	**3126**	**3004**	**2873**	**2591**	**2352**	**2352**	**2938**	**3077**	**1841**	**2563**	**2729**	**3113**

1958	1987	1901	1814	2318	1656	1411	1829	1728	1771	1483	1958	1915
1958	**1987**	**1901**	**1814**	**2318**	**1656**	**1411**	**1829**	**1728**	**1771**	**1483**	**1958**	**1915**

Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
10138	8799	4591	4303	1530	1148	669	3060	2678	4973	8034	8225
3347	2487	2774	1722	861	765	861	1530	1435	765	765	1243
6599	6599	6408	6025	3634	3156	3634	7747	5738	4782	3443	4686
4208	4227	3634	2678	1722	1435	2200	2965	2774	2295	1435	2104
7364	7173	1243	1148	956	956	1148	2008	1817	861	765	956
31656	**29285**	**18650**	**15876**	**8703**	**7460**	**8512**	**17310**	**14442**	**13676**	**14442**	**17214**

588	576	578	1449	455	487	552	563	466	662	638	674
2546	2453	2290	1844	1353	1747	2375	1772	1452	1886	2074	2441
3134	**3029**	**2868**	**3293**	**1808**	**2234**	**2927**	**2335**	**1918**	**2548**	**2712**	**3115**

2189	2131	2002	2146	1742	1483	2002	1800	1800	1541	1829	1930
2189	**2131**	**2002**	**2146**	**1742**	**1483**	**2002**	**1800**	**1800**	**1541**	**1829**	**1930**

STATE OF MINNESOTA	)	AFFIDAVIT OF SERVICE VIA
	) ss	E-FILING AND FIRST CLASS MAIL
COUNTY OF ST. LOUIS	)	

Susan Romans, of the City of Duluth, County of St. Louis, State of Minnesota, says that on the **29th** day of **June, 2017**, she e-filed Minnesota Power's Comments in Docket No. **Docket No. E999/CI-15-556** on the Minnesota Public Utilities Commission and the Energy Resources Division of the Minnesota Department of Commerce via electronic filing. The persons on the Official Service List were served as requested.

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Thomas	Koehler	TGK@IBEW160.org	Local Union #160, IBEW	2909 Anthony Ln St Anthony Village, MN 55418-3238	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Brian	Krambeer	bkrambeer@tec.coop	Tri-County Electric Cooperative	PO Box 626 31110 Cooperative Way Rushford, MN 55971	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Jon	Kramer	jk2surf@aol.com	Sundial Solar	4708 york ave. S Minneapolis, MN 55410	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Michael	Krause	michaelkrause61@yahoo.com	Kandiyo Consulting, LLC	433 S 7th Street Suite 2025 Minneapolis, Minnesota 55415	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Michael	Krikava	mkrikava@briggs.com	Briggs And Morgan, P.A.	2200 IDS Center 80 S 8th St Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Matthew	Lacey	Mlacey@grenergy.com	Great River Energy	12300 Elm Creek Boulevard Maple Grove, MN 553694718	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Holly	Lahd	lahd@fresh-energy.org	Fresh Energy	408 St. Peter Street Ste 220 St. Paul, MN 55102	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
James D.	Larson	james.larson@avantenergy.com	Avant Energy Services	220 S 6th St Ste 1300 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Douglas	Larson	dlarson@dakotaelectric.com	Dakota Electric Association	4300 220th St W Farmington, MN 55024	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Dean	Leischow	dean@sunriseenergyventures.com	Sunrise Energy Ventures	601 Carlson Parkway, Suite 1050 Minneapolis, MN 55305	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Deborah Fohr	Levchak	dlevchak@bepc.com	Basin Electric Power Cooperative	1717 East Interstate Avenue Bismarck, ND 585030564	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Annie	Levenson Falk	annie.levensonfalk@lec.leg.mn	Legislative Energy Commission	State Office Building, Room 65 100 Rev MLK Jr. Blvd St. Paul, MN 55155	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
John	Lindell	agorud.ecf@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012130	Electronic Service	Yes	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Susan	Ludwig	sludwig@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Rebecca	Lundberg	rebecca.lundberg@powerfullygreen.com	Powerfully Green	11451 Oregon Ave N Champlin, MN 55316	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Casey	MacCallum	casey@appliedenergyinnovations.org	Applied Energy Innovations	4000 Minnehaha Ave S Minneapolis, MN 55406	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Kavita	Maini	kmaini@wi.rr.com	KM Energy Consulting LLC	961 N Lost Woods Rd Oconomowoc, WI 53066	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Pam	Marshall	pam@energycents.org	Energy CENTS Coalition	823 7th St E St. Paul, MN 55106	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Samuel	Mason	smason@beltramielectric.com	Beltrami Electric Cooperative, Inc.	4111 Technology Dr. NW PO Box 488 Bemidji, MN 56619-0488	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Erica	McConnell	emcconnell@kfwlaw.com	Keyes, Fox & Wiedman LLP	436 14th Street, Suite 1305 Oakland, California 94612	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Dave	McNary	David.McNary@hennepin.us	Hennepin County DES	701 Fourth Ave S Ste 700 Minneapolis, MN 55415-1842	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
John	McWilliams	jmm@dairynet.com	Dairyland Power Cooperative	3200 East Ave SPO Box 817 La Crosse, WI 54601-7227	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Thomas	Melone	Thomas.Melone@AllcoUS.com	Minnesota Go Solar LLC	222 South 9th Street Suite 1600 Minneapolis, Minnesota 55120	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Andrew	Moratzka	apmoratzka@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Martin	Morud	mmorud@trunorthsolar.com	Tru North Solar	5115 45th Ave S Minneapolis, MN 55417	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Carl	Nelson	cnelson@mncee.org	Center for Energy and Environment	212 3rd Ave N Ste 560 Minneapolis, MN 55401	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Ron	Nelson	ron.nelson@ag.state.mn.us	Office of the Attorney General-RUD	Bremer Tower, Suite 1400 445 Minnesota Street Saint Paul, Minnesota 55101	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Ben	Nelson		CMMPA	459 South Grove Street Blue Earth, MN 56013	Paper Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
David W.	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency	Suite 300 200 South Sixth Street Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Rolf	Nordstrom	rnordstrom@gpisd.net	Great Plains Institute	2801 21ST AVE S STE 220 Minneapolis, MN 55407-1229	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Jeff	O'Neill	jeff.oneill@ci.monticello.mn.us	City of Monticello	505 Walnut Street Suite 1 Monticelllo, Minnesota 55362	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Gary	Oetken	goetken@agp.com	Ag Processing, Inc.	12700 West Dodge Road P.O. Box 2047 Omaha, NE 681032047	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Russell	Olson	rolson@hcpd.com	Heartland Consumers Power District	PO Box 248 Madison, SD 570420248	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Dan	Patry	dpatry@sunedison.com	SunEdison	600 Clipper Drive Belmont, CA 94002	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Jeffrey C	Paulson	jeff.jcplaw@comcast.net	Paulson Law Office, Ltd.	7301 Ohms Ln Ste 325 Edina, MN 55439	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Mary Beth	Peranteau	mperanteau@wheelerlaw.com	Wheeler Van Sickle & Anderson SC	Suite 801 25 West Main Street Madison, WI 537033398	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Jennifer	Peterson	jjpeterson@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Donna	Pickard	dpickard@aladdinsolar.com	Aladdin Solar	1215 Lilac Lane Excelsior, MN 55331	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
David G.	Prazak	dprazak@otpco.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380496	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Gayle	Prest	gayle.prest@minneapolismn.gov	City of Mpls Sustainability	350 South 5th St, #315 Minneapolis, MN 55415	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Gregory	Randa	granda@lakecountrypower.com	Lake Country Power	2810 Elida Drive Grand Rapids, MN 55744	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Mark	Rathbun	mrathbun@grenergy.com	Great River Energy	12300 Elm Creek Blvd Maple Grove, MN 55369	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
John C.	Reinhardt		Laura A. Reinhardt	3552 26Th Avenue South Minneapolis, MN 55406	Paper Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Michael	Riewer	MRiewer@otpco.com	Otter Tail Power Company	PO Box 4496 Fergus Falls, MN 56538-0496	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Michelle	Rosier	michelle.rosier@sierraclub.org	Sierra Club	2327 E. Franklin Avenue Minneapolis, MN 554061024	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Craig	Rustad	crustad@minnkota.com	Minnkota Power	1822 Mill Road PO Box 13200 Grand Forks, ND 582083200	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Robert K.	Sahr	bsahr@eastriver.coop	East River Electric Power Cooperative	P.O. Box 227 Madison, SD 57042	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Richard	Savelkoul	rsavelkoul@martinsquires.com	Martin & Squires, P.A.	332 Minnesota Street Ste W2750 St. Paul, MN 55101	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Thomas	Scharff	thomas.scharff@newpagecorp.com	New Page Corporation	P.O. Box 8050 610 High Street Wisconsin Rapids, WI 544958050	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Larry L.	Schedin	Larry@LLSResources.com	LLS Resources, LLC	12 S 6th St Ste 1137 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Christopher	Schoenherr	cp.schoenherr@smmpa.org	SMMPA	500 First Ave SW Rochester, MN 55902-3303	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Dean	Sedgwick	N/A	Itasca Power Company	PO Box 457 Bigfork, MN 56628-0457	Paper Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Maria	Seidler	maria.seidler@dom.com	Dominion Energy Technology	120 Tredegar Street Richmond, Virginia 23219	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
William	Seuffert	Will.Seuffert@state.mn.us		75 Rev Martin Luther King Jr Blvd 130 State Capitol St. Paul, MN 55155	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Patricia	Sharkey	psharkey@environmentallawcounsel.com	Midwest Cogeneration Association.	180 N. LaSalle Street Suite 3700 Chicago, Illinois 60601	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Bria	Shea	bria.e.shea@xcelenergy.com	Xcel Energy	414 Nicollet Mall Minneapolis, MN 55401	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Doug	Shoemaker	dougs@mnRenewables.org	MRES	2928 5th Ave S Minneapolis, MN 55408	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Mrg	Simon	mrgsimon@mrenergy.com	Missouri River Energy Services	3724 W. Avera Drive P.O. Box 88920 Sioux Falls, SD 571098920	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Brendon	Slotterback	brendon.slotterback@minneapolismn.gov	City of Minneapolis	350 S 5th Street, Room M315 Minneapolis, MN 55415	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Ken	Smith	ken.smith@districtenergy.com	District Energy St. Paul Inc.	76 W Kellogg Blvd St. Paul, MN 55102	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Ken	Smith	ken.smith@ever-greenenergy.com	Ever Green Energy	1350 Landmark Towers 345 St. Peter St St. Paul, MN 55102	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Beth H.	Soholt	bsoholt@windonthewires.org	Wind on the Wires	570 Asbury Street Suite 201 St. Paul, MN 55104	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Tom	Stanton	tstanton@nrri.org	NRRI	1080 Carmack Road Columbus, OH 43210	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Byron E.	Starns	byron.starns@leonard.com	Leonard Street and Deinard	150 South 5th Street Suite 2300 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
James M.	Strommen	jstrommen@kennedy-graven.com	Kennedy & Graven, Chartered	470 U.S. Bank Plaza 200 South Sixth Street Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Eric	Swanson	eswanson@winthrop.com	Winthrop Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Thomas P.	Sweeney III	tom.sweeney@easycleanenergy.com	Clean Energy Collective	P O Box 1828 Boulder, CO 80306-1828	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Steve	Thompson	stevet@cmmpa.org	Central Minnesota Municipal Power Agency	459 S Grove St Blue Earth, MN 56013-2629	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
SaGonna	Thompson	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Stuart	Tommerdahl	stommerdahl@otpco.com	Otter Tail Power Company	215 S Cascade St PO Box 496 Fergus Falls, MN 56537	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Pat	Treseler	pat.jcplaw@comcast.net	Paulson Law Office LTD	Suite 325 7301 Ohms Lane Edina, MN 55439	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Lise	Trudeau	lise.trudeau@state.mn.us	Department of Commerce	85 7th Place East Suite 500 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Karen	Turnboom	karen.turnboom@newpagecorp.com	NewPage Corporation	100 Central Avenue Duluth, MN 55807	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Darryl	Tveitbakk	dalene@mncable.net	Northern Municipal Power Agency	123 2nd St W Thief River Falls, MN 56701	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Lisa	Veith	lisa.veith@ci.stpaul.mn.us	City of St. Paul	400 City Hall and Courthouse 15 West Kellogg Blvd. St. Paul, MN 55102	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Roger	Warehime	warehimer@owatonnautilities.com	Owatonna Public Utilities	208 South WalnutPO Box 800 Owatonna, MN 55060	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Paul	White	paul.white@prcwind.com	Project Resources Corp./Tamarac Line LLC/Ridgewind	618 2nd Ave SE Minneapolis, MN 55414	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Jason	Willett	jason.willett@metc.state.mn.us	Metropolitan Council	390 Robert St N Saint Paul, MN 55101-1805	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Daniel	Williams	DanWilliams.mg@gmail.com	Powerfully Green	11451 Oregon Avenue N Champlin, MN 55316	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Robyn	Woeste	robynwoeste@alliantenergy.com	Interstate Power and Light Company	200 First St SE Cedar Rapids, IA 52401	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	Yes	OFF_SL_15-556_OFF_SL_15-556_Official Service List
Thomas J.	Zaremba	TZaremba@wheelerlaw.com	WHEELER, VAN SICKLE & ANDERSON	Suite 801 25 West Main Street Madison, WI 537033398	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Christopher	Zibart	czibart@atcllc.com	American Transmission Company LLC	W234 N2000 Ridgeview Pkwy Court Waukesha, WI 53188-1022	Electronic Service	No	OFF_SL_15-556_OFF_SL_15-556_Official Service List