
O L S O N , B Z D O K & H O W A R D



June 24, 2020

Ms. Lisa Felice
Michigan Public Service Commission
7109 W. Saginaw Hwy.
P. O. Box 30221
Lansing, MI 48909

Via E-filing

RE: MPSC Case No. U-20697

Dear Ms. Felice:

The following is attached for paperless electronic filing:

Direct Testimony of Christopher Villarreal on behalf of Michigan Environmental Council, Natural Resources Defense Council, Sierra Club and Citizens Utility Board of Michigan

Exhibits MEC-54 through MEC-68

Proof of Service

Sincerely,

Tracy Jane Andrews
tjandrews@envlaw.com

xc: Parties to Case No. U-20697

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of
CONSUMERS ENERGY COMPANY for
authority to increase its rates for the
generation and distribution of electricity and
for other relief.

U-20697

ALJ Sally Wallace

DIRECT TESTIMONY OF CHRISTOPHER VILLARREAL

ON BEHALF OF

**MICHIGAN ENVIRONMENTAL COUNCIL,
NATURAL RESOURCES DEFENSE COUNCIL,
SIERRA CLUB, AND CITIZENS UTILITY BOARD OF MICHIGAN**

June 24, 2020

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U-20697**

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1 **I. INTRODUCTION**

2 **Q. Please state your name and qualifications.**

3 A. My name is Christopher Villarreal. I am President of Plugged In Strategies, a consulting
4 group that provides services and expertise on grid modernization, distribution system
5 planning, and related programs and policies. My business address is 9492 Olympia Drive,
6 Eden Prairie, Minnesota, 55347.

7 **Q. Please provide your educational background.**

8 A. I graduated from Baylor University in 1997 with a Bachelor of Arts in History.

9 **Q. Please describe your work and professional experience.**

10 A. I have over 20 years of experience in the electricity policy and regulatory field, with the
11 past eleven years focused on the policy and technical components of distribution system
12 planning, grid modernization and distributed energy resources (DER) at the state level. I
13 was staff for the California Public Utilities Commission for nine years and was Director of
14 Policy for the Minnesota Public Utilities Commission for two years. I have participated in
15 several training sessions in the United States and internationally on grid modernization and
16 distribution system planning and continue to participate in several working groups and
17 workshops at state commissions around the country. I have authored or co-authored several
18 white papers on electricity-related issues and was the Staff Chair of the National
19 Association of Regulatory Utility Commissioners (NARUC) Staff Subcommittee on Rate
20 Design. As Staff Chair, I oversaw the production of the NARUC Distributed Energy
21 Resources Rate Design and Compensation Manual (DER Manual) to assist state utility
22 commissions in becoming more educated on DER, the impacts on historic ratemaking
23 practices, an overview of impacts from DER on rate designs and compensation
24 methodologies, and an outline for information to gather in advance of action on DER.

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Q. Please describe your role at Plugged In Strategies.

A. I started Plugged In Strategies in 2017. In my current role as President, I provide consulting services related to the following topics:

- Grid Modernization;
- Distribution System Planning;
- Data Access and Data Privacy;
- Distributed Energy Resources;
- Performance Based Ratemaking; and,
- Rate Design.

In general, I educate clients, including state utility regulators, on the evolution of the distribution system in response to the growing role of DER. This includes providing educational seminars, participating in workshops, and assisting with planning for the ratemaking, rate design, and business model changes coming to the electricity system. This includes an understanding of a variety of market designs, regulatory and utility models, and how these models will evolve in response to changing customer expectations and availability of technology.

A copy of my CV is attached as Exhibit MEC-54.

Q. Have you previously filed expert testimony in a proceeding before the Michigan Public Service Commission?

A. Yes. I submitted testimony in the following cases:

- Case No. U-20134, In the matter of the application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief.

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- 1 • Case No. U-20162, In the matter of the application of DTE Electric Company
2 for authority to increase its rates, amend its rate schedules and rules governing
3 the distribution and supply of electric energy, and for miscellaneous accounting
4 authority.
- 5 • Case No. U-20359, In the matter of the Application of Indiana Michigan Power
6 Company for authority to increase its rates for the sale of electric energy and
7 for approval of depreciation rates and other related matters
- 8 • Case No. U-20561, In the matter of the Application of DTE Electric Company
9 for authority to increase its rates, amend its rate schedules and rules governing
10 the distribution and supply of electric energy, and for miscellaneous accounting
11 authority.

12 **Q. Are you sponsoring any exhibits today?**

13 A. Yes, I am sponsoring Exhibits MEC-54 through MEC-68:

14 MEC-54 (CV-1): CV of Christopher Villarreal

15 MEC-55: MEC-CE-1054

16 MEC-56: MEC-CE-1061

17 MEC-57: MEC-CE-1064

18 MEC-58: MEC-CE-1067

19 MEC-59: MEC-CE-1069

20 MEC-60: MEC-CE-1071

21 MEC-61: MEC-CE-1072

22 MEC-62: MEC-CE-1073

23 MEC-63: MEC-CE-1074

24 MEC-64: MEC-CE-1079

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1 MEC-65: MEC-CE-1080

2 MEC-66: MEC-CE-1081

3 MEC-67: MEC-CE-1082

4 MEC-68: MEC-CE-1083

5 **II. TESTIMONY OVERVIEW**

6 **Q. What is the purpose of your testimony?**

7 A. My testimony addresses Consumers Energy Company's (Consumers) distribution system
8 planning initiative, suggestions for improvements, recommendations for Consumers' next
9 5-year distribution plan, and recommendations for reductions in expenditures. Consumers'
10 distribution system planning process continues to lack sufficient internal integration as well
11 as integration with other programs. The requested \$722.7 million exposes customers to
12 significant over-spending and inefficient investments due to a flawed distribution planning
13 program.

14 **Q. Please summarize Consumers' testimony on distribution investments.**

15 A. Nearly all of Consumers' distribution investments are described in the testimony of
16 Witness Blumenstock. Witness Torrey provides an overarching narrative, which includes
17 the role of distribution investments in realizing the various programs outlined throughout
18 the rest of Consumers' application and associated testimony.
19 Consumers proposes to spend \$722.7 million for test year 2021 on its distribution system.
20 The distribution investments, as proposed by Witness Blumenstock, cover three
21 components: reliability needs, new customer demand, and grid modernization. According
22 to Witness Torrey, the distribution investments are "to improve system reliability and

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1 safety.”¹ The distribution system improvements follow from their 2018 5-year distribution
2 plan, known as their Electric Distribution Infrastructure Investment Plan (EDIIP).²
3 However, in Torrey’s estimation:

4 While the Company has made significant investments to enhance system reliability
5 over the years, the Company continues to be challenged by the size and scope of its
6 aging infrastructure. More frequent and severe storms and tree overgrowth in
7 Company right-of-ways pose significant challenges to reliability.³

8 At the same time, Witness Torrey states that the proposed investments “will enable the
9 Company to build for the future. As described in the Company’s EDIIP and IRP, the
10 Company is thoughtfully moving from large, baseload generating plants to cleaner, more
11 efficient, and more modular resources.”⁴

12 **Q. Please summarize your response to Consumers’ testimony.**

13 A. Consumers should be commended for laying out a vision based on a cleaner electricity
14 system for Michigan and its customers. Additionally, Consumers goes into great details
15 discussing its potential investments, needs, and organization. Unfortunately, though, as
16 currently set out in Witness Blumenstock’s testimony, there is little evidence of progress
17 by Consumers to invest in a distribution system that can support and enable a cleaner and
18 more efficient electricity system. Rather, despite having gone through a draft and final
19 submission of its 2018 EDIIP, and a second rate case during that same time, Consumers
20 has yet to show that it is developing a coherent and logical 5-year distribution plan that
21 shows how its investments are being more integrated and aligned internally and throughout

¹ Direct Testimony of Michael A. Torrey, p. 8.

² Consumers Electric’s 2018 EDIIP was Ex A-111 in Case No. U-20134 and is also filed in Case No. U-20147 (filed April 13, 2018).

³ *Id.*

⁴ Torrey Direct, p. 8.

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1 the utility. Consumers' testimony continues to lack a clear and straightforward discussion
2 of how its distribution investments, as identified by Witness Blumenstock, are aligned with
3 each other, or makes use of all available data in the identification of those investments.
4 Lastly, Consumers' distribution planning and associated investments do not appear to be
5 planned for and built for the future. Instead, by only focusing on the immediate next two
6 years, Consumers misses opportunities for actually planning for the future in a more
7 organized and comprehensive manner.

8 **Q. What are your primary concerns with Consumers' proposed distribution system**
9 **investments in this proceeding?**

10 A. I have several. First, at a high level, there is little evidence that Consumers is taking into
11 account the guidance provided to them by the Commission throughout the distribution
12 system planning proceeding in U-17990 and U-20147 regarding development of the 5-year
13 distribution plan. This is the second rate case submitted by Consumers since their initial
14 submission of the 2018 EDIIP, its 5-year distribution plan, and there appears to be little
15 use or reliance on that plan as a guiding document to organize investments around a
16 common set of planning initiatives, models, or forecasts. The Commission must send
17 clearer guidance and expectations about the role and use of the 5-year distribution plan as
18 it applies to utility investments and review in the rate case. For example, in the
19 Commission's September 11, 2019 order in Docket No. U-20147, the Commission noted
20 that "Using a planning horizon beyond five years can help ensure near-term investments
21 will provide long-term ratepayer value and will be adaptive to emerging energy
22 technologies that may alter the way energy is produced, delivered, and used in the future."⁵

⁵ Case No. U-20147, Sept. 11, 2019, Order at 4.

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1 The proposed investments in the current rate case docket fail to meet this guidance, and
2 Consumers provides no details as to how its proposed investments will provide long-term
3 value and meet the future electricity system, as envisioned by the Commission. Rather,
4 Consumers maintains a set of three separate distribution planning functions that do not
5 appear to have much if any relation to one another, nor do they appear to meet the
6 Commission's expectations for the future electricity system.

7 A more ideal distribution planning process would include a clear set of specific items that
8 the utility would be required to provide, and then in its rate case, identify how these
9 investments are meeting those items. As discussed below, an example from the Minnesota
10 distribution planning initiative relates to consideration of non-wires alternatives (NWA).
11 In that example, for every substation project that costs more than \$2 million, the utility is
12 required to provide details about how it first considered an NWA solution, and then explain
13 why (or why not) an NWA solution was proposed.

14 In addition, as related to my concerns about the utility's failure to integrate distribution
15 system planning into distribution system spending, I am concerned that Consumers has
16 failed to incorporate technology to guide its forecasting. Moreover, its grid modernization
17 program lacks a coherent foundation. Finally, Consumers continues to fall short of
18 adequate consideration and integration of non-wires alternative solutions, a further
19 consequence of an ineffective and segregated distribution planning process.

20 **Q. What are your recommendations to the Commission?**

21 A. I provide the following recommendations:

- 22 1) **Distribution Planning should be supported by more robust data, forecasting,**
23 **and planning integration.** The Company's distribution investment forecasts and
24 models fail to utilize all available data, such as AMI data, which would provide

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1 more details about actual customer demand and load profiles. The forecasts and
2 models fail to make full use of data generated from other utility processes, such as
3 interconnection, that could also be used to better identify customer demand and
4 load profiles. These data sets can also be used to support more specific distribution
5 investments at a local level based on actual customer demand. As such, Consumers
6 forecasts and models should not be relied upon by the Commission due to lack of
7 data. Furthermore, Consumers fails to tie distribution expenditures to any
8 reasonable forecast or modeling expectations and maintains three functionally
9 separate distribution planning processes without any clear relation to one another.
10 The Commission should require that future load forecasts be based upon customer
11 AMI data and data generated from the utility's hosting capacity analysis and
12 interconnection process.

13 2) **Rate case distribution investments should be considered over a longer horizon**
14 **and align with the 5-year distribution planning process.** It is increasingly clear
15 that there is a significant gap between the rate case process and the expectations of
16 the 5-year distribution plan. In the rate case, Consumers plans 1-2 years ahead of
17 time and focuses on those projects within that timeframe, without consideration of
18 those investments in the longer-term 3-5 year distribution planning timeframe. As
19 such, Consumers' distribution investment strategy remains frustratingly tied to an
20 outmoded and short-sighted timeline for distribution planning. The Commission
21 should require future rate cases to include and identify potential projects that look
22 beyond the 1-2 year test year rate case model that has now become common in
23 Michigan. This would include a showing of how investments support longer term
24 needs, including a prioritization of those 3-5 year needs.

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1 3) **Consumers should be directed to consider NWA.** Consumers fails to adequately
2 consider the potential for non-wires alternatives (NWA) as an alternative to
3 infrastructure investment. Part of this is due to the aforementioned misalignment
4 between the 1-2 year planning cycle for the utility's rate cases and the best practice
5 of engaging in distribution system planning on a longer 3-5 year (or longer)
6 horizon. By looking beyond the immediate 1-2 year rate case justification, NWAs
7 would have a better chance to be considered and identified as an option to defer
8 certain infrastructure investments into the future. Additionally, the realities of the
9 existing cost of service framework incentivize capital projects at the expense of
10 other, perhaps less costly, options. NWAs are therefore not provided an
11 opportunity for consideration because their benefits will always fall just outside the
12 rate case timeframe. To remedy these concerns, the Commission should direct
13 Consumers in its next rate case to identify criteria, locations, and potential projects
14 where NWAs may be considered as a solution rather than additional capital. In
15 addition, Consumers should work with stakeholders to develop criteria to identify
16 potential locations, and the identification of locations over the next 5 years where
17 NWAs could be considered. Prioritization of locations should be considered for
18 those locations where costs to upgrade or rebuild a substation are in excess of \$1.5
19 million.

20 4) **The Commission should disallow a portion of proposed substation reliability**
21 **upgrade and LVD line capacity costs because the Company has not**
22 **demonstrated their reasonableness with reliable data.** For the reasons discussed
23 above – the lack of reliable data, robust planning, and long-term perspective, the
24 Commission should disallow 50% of Consumers proposed \$4.5 million to fund

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three new or rebuilt substations in the test year and also its proposed \$11.3 million test year spending for its LVD Lines Capacity program. Consumers has not provided a thorough NWA review and has not supported the reasonableness of these capital investments with reliable forecasts and fair consideration of NWA alternatives.

- 5) **Some of Consumers' proposed grid modernization investments should be delayed until integrated planning is demonstrated.** Funding for Advanced Distribution Management System (ADMS), Distributed Energy Resources Management System (DERMS), and the portable grid storage investment should be eliminated until Consumers proposes a detailed integrated distribution system planning process. These investments in particular appear unaligned with any larger, integrated effort by Consumers to build an integrated distribution planning process. Lastly, due to the on-going impacts from COVID-19 throughout Michigan, the Commission should strictly consider the impacts of utility spending and the ability of customers to fund these investments.

III. INTEGRATED GRID PLANNING

Q. Please describe Consumers' description of its distribution system planning process.

A. Consumers' distribution planning strategy is focused on five components:

- Enhance cybersecurity, physical security, and safety;
- Improve reliability and resilience;
- Optimize system cost over the long term
- Increase sustainability and reduce waste in the system; and

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- 1 • Enable greater control.⁶

2 Additionally, Witness Blumenstock describes how Consumers' distribution system is
3 divided into a high voltage system and a low voltage system. Consumers first looks to
4 capital solutions to address any need for either system, and then prioritizes projects across
5 the two groups.⁷

6 **Q. Is this description consistent with Consumers' filed 5-year distribution plan?**

7 A. Consumers states that the proposed investments are consistent with their 2018 EDIIP.
8 Consumers does note, however, that the expenses proposed by Witness Blumenstock are
9 in excess of what was originally projected in the 2018 EDIIP.⁸ Part of the reason for the
10 increase in spending is that Consumers now has more information about the performance
11 of its distribution system. According to Consumers, when it submitted its first 5-year
12 distribution plan, it did not have sufficient visibility into its distribution system. With more
13 information, Consumers' describes its system as deteriorating, hence the need for increases
14 in distribution spending.⁹

15 **Q. What is important about Consumers' distribution system deterioration?**

16 A. As Consumers notes, it can have a significant impact on its SAIDI and CAIDI.¹⁰ However,
17 a more important point underlies Consumers' realization about the deterioration of its
18 system. Despite the increase in information Consumers has about its distribution system, it
19 is clear the Company still does not have a sufficient understanding of the performance of
20 its distribution system. Furthermore, this lack of understanding is compounded by

⁶ Direct Testimony of Richard T. Blumenstock, p. 12.

⁷ *Id.* at 12-13.

⁸ *Id.* at 6, 13.

⁹ *Id.* at 18.

¹⁰ *Id.*

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Consumers' overall rate case distribution planning effort which looks only 1-2 years in advance, despite the Company having produced a 5-year distribution plan.

Q. Please explain.

A. Throughout Witness Blumenstock's testimony, he describes a litany of individual utility programs focused on a variety of technologies and purposes for both the low voltage system and the high voltage system. Each of these individual programs are then organized, planned, and implemented separately, with little alignment or organization between them, nor more broadly with Consumers' forecasting efforts.¹¹ This is highlighted even more when looking at Consumers' Grid Modernization strategy, which is focused on three pieces:

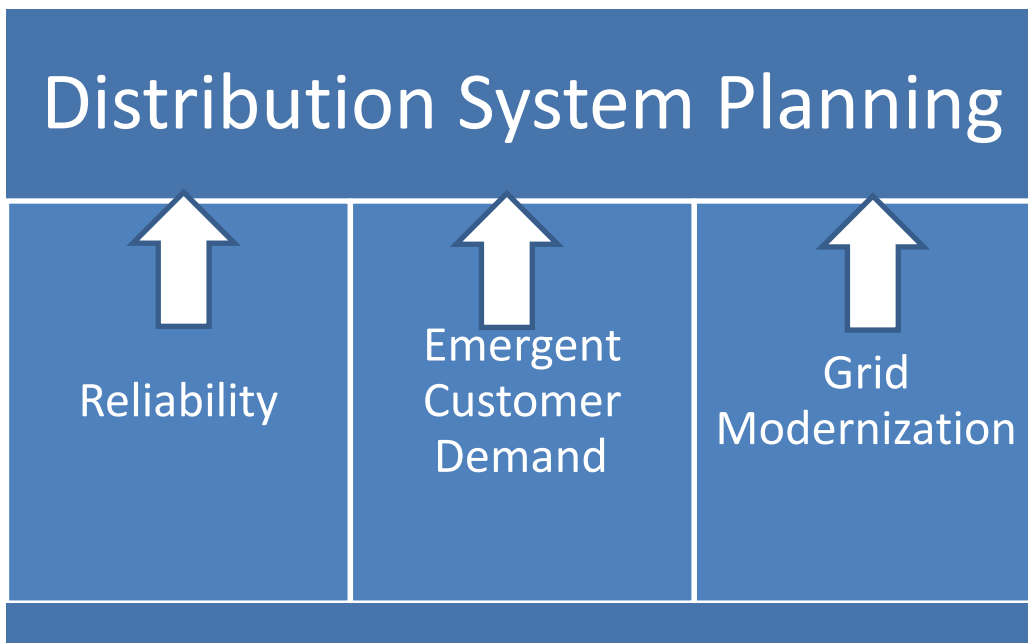
- Reliability and resilience – Automated re-routing of power flows around an outage and restoration following an outage, commonly known as Fault Location, Isolation, and Service Restoration (FLISR);
- System efficiency and optimization – Energy efficiency gains and peak reduction through Volt-VAR Optimization (VVO), which enables coordinated control of voltage regulators and capacitor banks to reduce system losses and eliminate waste; and CVR, which allows optimization of service-point voltages to reduce energy demand; and
- DER integration – Enabling increased utility ability to coordinate and holistically manage an increasing penetration of DERs on the electric distribution system.¹²

¹¹ See, e.g., Ex MEC-57 (MEC-CE-1064), Ex MEC-58 (MEC-CE-1067), Ex MEC-59 (MEC-CE-1069), Ex MEC-60 (MEC-CE-1071), Ex MEC-64 (MEC-CE-1079), and Ex MEC-68 (MEC-CE-1083).

¹² Blumenstock Direct, p. 37.

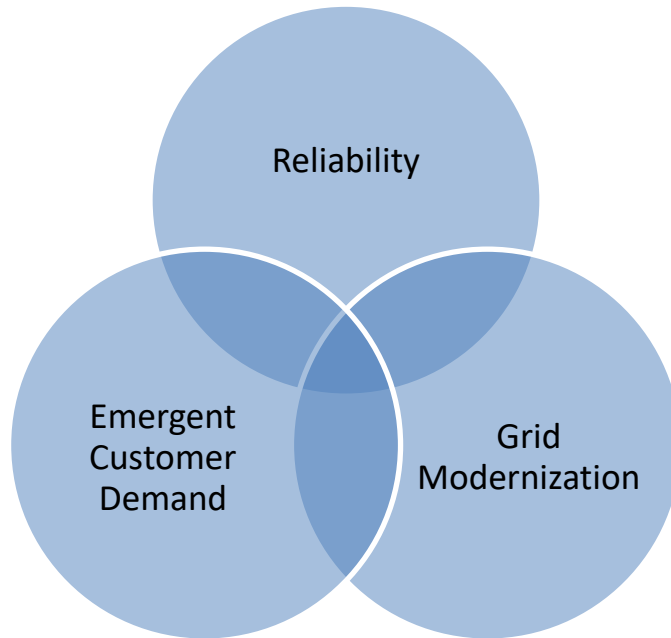
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What is missing from this list is integration and alignment with the other two parts of Consumers' distribution planning process. The grid modernization planning process looks entirely at technology to support Consumers' grid modernization program, but says nothing about how investments in grid modernization are used in conjunction with reliability needs or emergent customer demand planning. As such, this results in Consumers having three separate planning processes all occurring without significant alignment amongst them: 1) reliability needs; 2) emergent customer demands; and 3) grid modernization. There is no evidence that Consumers is making any attempt to understand or identify how to coordinate these three planning processes into one organized distribution system planning initiative. The below figure illustrates Consumers' current, siloed approach to distribution planning:



In this illustration, each component of Consumers' distribution planning remains in its silo. In actuality, an effectively integrated distribution planning would look more like this:

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1
2 This second illustration recognizes that each part must be considered in conjunction with
3 the other. Going forward, grid modernization should be considered as the foundation upon
4 which reliability and emergent customer demand needs are planned.

5 **Q. Does Consumers reference any examples of an integrated distribution planning**
6 **process?**

7 A. Yes, but it mischaracterizes its use.

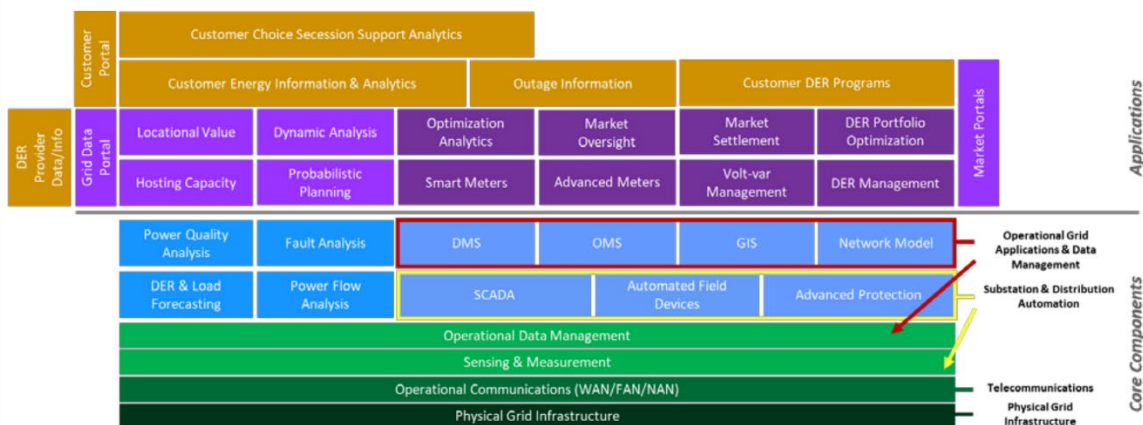
8 Consumers identified the Modern Distribution Grid Next Generation Distribution System
9 Platform (DSPx) initiative as a framework for which it is organizing its grid modernization
10 program around. However, Consumers discusses the DSPx framework only in the context
11 of its grid modernization strategy. This is important because Consumers appears to be
12 using the DSPx framework in an exercise of confirmation bias. The framework is designed
13 to be a holistic re-imaging of the utility's entire distribution planning strategy, not just its

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grid modernization planning process. Figure 20 in Witness Blumenstock's testimony identifies the components identified in DSPx that Consumers is undertaking.¹³

RICHARD T. BLUMENSTOCK
DIRECT TESTIMONY

FIGURE 20
DOE NEXT GENERATION DISTRIBUTION SYSTEM PLATFORM AND APPLICATIONS



The fact that Consumers is doing the identified items in the image above and has included this identification in its grid modernization strategy does not mean it is implementing the DSPx framework. Instead, the DSPx framework should be utilized as the foundational component of all its distribution planning activities. All investments, be they for emergent needs, new demand, or grid modernization, should be filtered through this re-organization of planning.

Q. Are there examples in this case that show this misuse?

A. Yes. In response to several discovery requests, Consumers repeatedly describes how each individual program is evaluated independently of each other and only within set time

¹³ Blumenstock Direct, p. 40.

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1 periods.¹⁴ Indeed, in response to several requests, Consumers notes that it does not use its
2 Advanced Metering Infrastructure (AMI) data to identify needs at its LVD or HVD
3 systems.¹⁵ In its 2018 EDIIP, AMI data was a key part of its Data Lake proposal which
4 would act as a single location that collects data from across its operating system.¹⁶ Again,
5 it appears that Consumers is not fully utilizing all the data it is capable of using. Looking
6 back to the DSPx figure, the point of that figure is not simply to say that a utility is doing
7 a part of it, but, rather, to assist the utility in identifying an organizational structure to
8 breakdown down planning siloes, not to reinforce them.

9 **IV. GRID MODERNIZATION**

10 **Q. Can you explain how Consumers is treating the grid modernization initiative?**

11 A. Yes. Consumers identifies its grid modernization plan as focusing on two components of
12 an overall strategy: “excelling at the basics”; and “building for the future.”¹⁷ Consumers’
13 focus for grid modernization is the use of advanced technologies as the building blocks for
14 the future, including more automation, more communications, and better asset
15 management. Importantly, Consumers identifies a project to develop a complete and
16 accurate model of its distribution system that is integrated with its Geographic Information
17 System (GIS).¹⁸

18 **Q. What is included in Consumers’ Grid Modernization program?**

¹⁴ See, Ex MEC-56 (MEC-CE-1061), Ex MEC-58 (MEC-CE-1067), Ex MEC-59 (MEC-CE-1069), Ex MEC-60 (MEC-CE-1071), Ex MEC-66 (MEC-CE-1081).

¹⁵ See, Ex MEC-55 (MEC-CE-1054), Ex MEC-60 (MEC-CE-1071), Ex MEC-62 (MEC-CE-1073), and Ex MEC-68 (MEC-CE-1083).

¹⁶ 2018 EDIIP, *supra* note 2, p. 60.

¹⁷ Blumenstock Direct, p. 37.

¹⁸ Blumenstock Direct, p. 41.

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A. Consumers identifies a suite of technologies, including FLISR, VVO, DSCADA, ADMS, and DERMS. It is projecting \$69.4 million for its grid modernization program investments.¹⁹

FIGURE 38
GRID MODERNIZATION INVESTMENT CATEGORY
EXPENDITURES AND UNITS

Investment Categories	Capital	# of Units
Automation		
DSCADA & SCADA	\$21,542,000	118*
ATR loops	\$21,258,000	39
Line sensors	\$4,544,000	100
Regulator Controllers	\$13,077,000	393
Advanced Tech.		
ADMS	\$5,900,000	n/a
DERMS	\$1,184,000	n/a
Grid operational analytics	\$748,000	n/a
Grid technologies	\$1,350,000	n/a
Total	\$69,604,000	

Taken together, these technologies are to provide greater visibility and data about the operations of Consumers' system.

Q. Do you have any comments on the appropriateness of these investments?

A. At a high level, these are all the types of investments utilities around the country are considering making for their distribution system. In some cases, these investments are in response to system needs. For example, DSCADA would provide greater visibility into Consumers' distribution system and generate data about the operations of its system that could be leveraged for additional programs like hosting capacity and more informed

¹⁹ *Id.* at 146-147.

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1 distribution planning. However, consistent with the remainder of my testimony,
2 Consumers' investments appear to be divorced from the other planning components and
3 provide no alignment across the distribution planning process. The grid modernization
4 investments appear to be largely independent of the short-term investments identified in
5 Consumers' testimony. It is therefore difficult to assess the need for these investments at
6 this time or how Consumers intends to use them for the myriad of individual reliability and
7 emergent customer demand programs that take up the majority of Consumers' testimony.
8 For example, Consumers says they have no plans to really include a lot of the data and
9 analytics from investments in the LVD reliability program in their other grid modernization
10 programs.²⁰ However, without a clear timeline and explanation of how the LVD reliability
11 program will benefit or utilize the information from the grid modernization program, the
12 entirety of the grid modernization budget would appear to be unnecessary.

13 At a high level, several of the investments included in the grid modernization program
14 would help the utility better plan, operate, and optimize its system. However, as proposed,
15 the grid modernization investments appear to be on an island surrounded by typical utility
16 planning processes built upon historical models, assumptions, and processes. The test year
17 investments, such as in reliability and capacity needs at both the LVD and HVD, do not
18 appear to use any of the data available to it from the grid modernizations undertaken to
19 date. It is challenging to support investments in potentially useful technologies if they are
20 not being planned in a manner to maximize their effectiveness due to poor distribution
21 planning. I therefore recommend the Commission deny cost recovery for the following grid
22 modernization programs:

²⁰ Ex MEC-64 (MEC-CE-1079).

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- 1 • **DERMS-** The Commission should deny funding for this project. Considering the
2 small scale that Consumers is proposing for this project, and the apparently little
3 value the proposed program would provide, if Consumers wants to run a small pilot,
4 it can do so, but can fund it with shareholder funds, rather than ratepayers.
- 5 • **ADMS-** The Commission should deny funding for this project. ADMS is a
6 technology that will be the foundation for a more integrated and optimized
7 distribution utility. However, Consumers does not have that system in place today,
8 and has no concrete plan or deliverables to get to that future. If approved,
9 ratepayers would be paying for a system that is not providing benefits to
10 Consumers' overall distribution planning process. Furthermore, due to the role
11 ADMS can play to support the distribution system planning process overall, the
12 Commission should direct Consumers to explain in its next rate case how an ADMS
13 system would be that foundational investment for the entirety of its distribution
14 planning, not just limited to its grid modernization planning process.

15 **Q. Do you have any response to Consumers' grid modernization strategy?**

16 A. Yes. I am pleased to see that Consumers identifies the importance of having a complete
17 and accurate network model. The GIS system is one of the foundational components of
18 any future grid planning initiative, and if a utility's GIS system is outdated or inaccurate,
19 that will lead to significant challenges in the future.

20 It should be noted that this project was identified in its 2018 EDIIP, and there Consumers
21 noted that some of its GIS data was inaccurate.²¹ In its 2018 EDIIP, Consumers stated they

²¹ 2018 EDIIP, *supra* note 2, p. 57-58.

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1 expect to have a completed review done by end of 2019.²² There, like in the current
2 application, Consumers noted the importance of the GIS system to its future advanced
3 technology investments.

4 What this means is that Consumers is only using the GIS in conjunction with future,
5 advanced technology investments and not integrating this information with the other
6 components of its distribution planning processes. For example, in its 2018 EDIIP,
7 Consumers stated that the upgraded model “will support the advanced applications” as
8 identified in that plan.²³ In Witness Blumenstock’s testimony in this case, GIS
9 improvements and investments appear in conjunction future investments associated with
10 advanced technologies.

11 To be sure, I am supportive of an accurate and reliable GIS system; however my concern
12 is the extent to which the lack of an accurate network model impacts Consumers’ spending
13 and planning throughout its distribution planning processes.

14 **V. DISTRIBUTION SPENDING AND NON-WIRES ALTERNATIVES**

15 **Q. Do you have additional comments about Consumers’ distribution plan?**

16 A. Yes. I have concerns about the investments and plans as identified by Consumers and the
17 lack of future investment needs and coordination with investments identified in this rate
18 case. Additionally, the Grid Storage program includes a costly storage solution that
19 provides an example of Consumers’ overall lack of integration and alignment of its
20 planning process, the gap in planning timelines between the rate case and its 5-year
21 distribution plan, and the lack of appropriate consideration for NWAs.

²² *Id.* at 200.

²³ *Id.*

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1 **Q. Please explain.**

2 A. As discussed above, Consumers generally portions out its distribution investments into
3 three buckets: accelerated reliability investments, emergent customer needs, and grid
4 modernization.²⁴ Consumers dedicates nearly 300 pages of testimony going through the
5 specific programs and investments it identified as necessary for each of the three buckets.
6 However, all three items are considered, planned, and explained independently of each
7 other. A program designed to respond to an immediate reliability need does not explain
8 how it has been coordinated or aligned with a potential emergent customer need or whether
9 that investment can be leveraged with the grid modernization investments.

10 To note merely one example, of which there are several, Consumers describes an LVD
11 Substations Reliability program.²⁵ This program focuses on the substations where
12 Consumers' HVD and LVD systems interconnect. There are five potential solutions for
13 this program:

- 14 (i) new or rebuilt substations;
15 (ii) new mobile substations;
16 (iii) animal mitigation;
17 (iv) transformer replacements; and
18 (v) regulator replacements.²⁶

²⁴ Blumenstock Direct, p. 6.

²⁵ *Id.* at 132.

²⁶ *Id.*

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1 Consumers then identified several locations in need of investment under this category.

2 Consumers also notes that non-wires alternatives are not an appropriate option here due to
3 concerns about costs, technology maturity, and concerns about performance.²⁷

4 There are several issues with how Consumers is describing this program and its relation to
5 other planning activities. First, Consumers' planning for locations is predicated upon
6 historical trends with a focus on outages and other reliability concerns.²⁸ Second,
7 Consumers does not utilize usage or demand forecasts in the consideration of locations that
8 may be in need of upgrade in response to usage. In particular, Consumers noted that it
9 does not use AMI data in the identification of potential locations for this program.²⁹ AMI
10 data would give the planner a sense of customer demand at that location and whether
11 customer demand is causing any operational impact on a location. Third, because
12 Consumers only looks two years into the future, Consumers is unable to proactively plan
13 to identify locations several years in advance that may be in need of repair or replacement.³⁰
14 While Consumers looks 10 years into the future for new substations, the Company only
15 looks two years into the future for upgrades or repair. This has two important
16 consequences: the Company will never be able to identify potential opportunities for
17 NWAs, and there appears to be no alignment with Consumers' grid modernization
18 investments.

19 **Q. Why are these consequences important?**

²⁷ *Id.* at 134.

²⁸ *Id.* at 133-134.

²⁹ Ex MEC-62 (MEC-CE-1073).

³⁰ Ex MEC-60 (MEC-CE-1071).

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1 A. As it applies to grid modernization investments, if Consumers is undergoing a significant
2 rebuild or upgrade, it would be an opportune time to consider coordinating those
3 investments with grid modernization investments, such as communications infrastructure
4 or systems designed to provide better visibility and enhanced sensor capabilities. There
5 appears to be no clear alignment or leveraging of these different planning processes.

6 For NWAs, since these locations are only identified two years in advance, it will be near
7 impossible for an NWA to be considered in that short of time. Typically, NWAs require
8 3-5 years of advance planning, so a program, like Consumers' LVD Substation Reliability,
9 would never identify NWAs as a potential solution. This is a significant failure of
10 Consumers' planning process.

11 As discussed by Mr. Blumenstock, Consumers has identified three substation rebuild
12 projects for 2021 at a cost of \$4.5 million, or \$1.5 million per project.³¹ It makes sense
13 that for projects that are being performed in 2021, an NWA option is probably not cost-
14 effective. However, for a substation rehabilitation project that is needed in 2024 or 2025,
15 an NWA may be cost-effective, plus that timeline would give potential developers
16 opportunity to develop portfolios and identify potential projects that could be deployed by
17 that time. As described by Consumers, its planning process simply does not look out far
18 enough to allow NWAs a fair opportunity to be considered as an alternative. This means
19 that potential projects that may be more cost-effective for customers are not considered and
20 only those projects and solutions identified by Consumers will go forward. This is an
21 inequitable result for customers and for markets.

³¹ Blumenstock Direct, p. 136.

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1 To account for this lack of transparency and planning, I recommend that the Commission
2 reduce by 50% the funding request for \$4.5 million to fund the three new or rebuilt
3 substations. By reducing funding by half, the Commission can send a signal to utilities
4 that it is expecting a more thorough and future-oriented distribution system planning
5 process that does a better job of identifying projects farther in advance. Consumers noted
6 that spending in this project has been increasing over the past several years,³² yet planning
7 is not being done sufficiently in advance to identify options or alternatives other than to
8 increase capital spending.

9 **Q. Was the 2018 EDIIP supposed to address this deficient planning?**

10 A. In a sense, yes. The 2018 EDIIP is supposed to assist the utility in looking out into the
11 future beyond what they historically and currently do for distribution planning. By looking
12 further than two years into the future, the utility should be able to identify potential
13 opportunities where an NWA could be implemented, among other benefits. However,
14 since Consumers' separate planning processes for rate case distribution investments do not
15 align with the 5-year distribution plan, there is little to no opportunity in the rate case to
16 sufficiently identify or consider opportunities for NWAs, even where they could be
17 implemented technically.

18 Additionally, consistent with the DSPx framework, a 5-year distribution plan should also
19 identify the steps the utility is taking to better organize and harmonize strategies across the
20 utility, including better alignment and integration with forecasting. Increasingly the
21 distribution system will have valuable information about customers, including granular
22 data about customer demand, changes to customer demand, and impacts from distributed

³² Blumenstock Direct, p. 135-136.

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1 energy resources. This information would enable the Company to identify locations on the
2 distribution system where distributed energy resources and NWAs could be located to
3 optimize the system's performance. The current 5-year distribution plan does not include
4 those goals. Therefore, in proposing the investments in this rate case, Consumers must look
5 not only at what the 2018 EDIIP outlined, but must also recognize and plan for the real
6 changes occurring across the system. Failing to account for those changes here, in the rate
7 case, will result in over-investment across the distribution system and higher costs for
8 customers.

9 **Q. You mentioned the importance of forecasting to distribution planning. Can you**
10 **explain further?**

11 A. For any utility that is looking at planning its system, those plans start with the forecast and
12 associated assumptions. The forecast impacts the utility's integrated resource planning and
13 it should also impact a utility's distribution plan. Additionally, information from the
14 distribution system should flow into a utility's demand forecast and into its integrated
15 resource plan. Colloquially, this is referred to as Integrated System Planning. This means
16 the major components of utility planning -- integrated resource planning and distribution
17 system planning -- are organized and aligned with its forecasting.

18 For example, if the load forecast identifies growth at a location that would exceed that
19 substation's rating, a utility could increase the capacity at that location through a substation
20 upgrade. That would result in new distribution investment, and potentially new demand
21 growth opportunities. It also could be an opportunity to utilize NWAs or it could signal to
22 the market to locate new resources such as storage, or increase energy efficiency spending
23 at that location. The result of these demand-side solutions would reduce overall demand
24 at that location, deferring new investment in the distribution grid as well as reducing the

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1 potential new resources that would be considered in an IRP. As noted below, forecasts are
2 the starting point for both an integrated resource plan and a distribution plan, all of which
3 require greater coordination and alignment. Ensuring this coordination is occurring would
4 be the next logical step in assuring that all utility investments are aligned, coordinated, and
5 integrated across the utility's integrated resource planning and distribution system planning
6 process.

7 **Q. Does Consumers coordinate its forecasts with its investment planning?**

8 A. Yes, but it does so using incomplete information, and its investment planning is not
9 sufficiently coordinated with distribution planning.

10 In regards to whether Consumers uses actual customer demand information from its AMI
11 system, Consumers states "AMI data are not used as part of developing the customer
12 forecasts."³³ This is especially concerning since Consumers' customers paid for that
13 technology investment, yet the Company is not using the one source of information that
14 actually tells Consumers about customer usage trends. Additionally, in response to
15 questions regarding Consumers' use of demand forecasts in identifying needs, Consumers
16 notes that demand forecasts are not used for its reliability program investments.³⁴
17 Furthermore, in looking at Consumers' LVD Substation rebuild program, Consumers notes
18 substation replacement projects are "based on its inspections and corresponding
19 engineering judgment."³⁵ All of this is to say that it is entirely unclear to what extent the
20 utility forecasts inform the investment needs of the distribution system, be it for
21 Consumers' reliability needs, emergent customer demand needs, or grid modernization.

³³ Ex MEC-68 (MEC-CE-1083).

³⁴ Ex MEC-61 (MEC-CE-1072).

³⁵ Ex MEC-64 (MEC-CE-1079).

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1 **Q. How does the lack of integration manifest itself in this case?**

2 A. For example, using the LVD Substation Reliability program again, Consumers says that it
3 does not include DER forecasts in its models. While it says it uses demand forecasts for
4 new substations, it does not use AMI data in planning for these projects.³⁶ Furthermore,
5 Consumers also notes that it does not use AMI data in the development of its demand
6 forecasts.³⁷ Here, Consumers has a fully completed AMI roll-out, and rate-based the
7 expense of that roll-out, and yet the source that provides insight into how and when
8 customers are using data is not used in its distribution planning or in its forecasts.
9 Consumers notes that it collects information about customer demand and some quality
10 information, such as kvar/hour, but that it does not use this information as part of its
11 reliability analysis.³⁸ Certainly this information is valuable to understand the reliability of
12 the system at locations across the Consumers system, and certainly, with the growth of
13 distributed energy resources, this information would be a data set that provides Consumers
14 with notice of changing customer demand and load profiles. This mismatch becomes
15 clearer when looking at Consumers' power flow study.

16 **Q. Please explain the power flow study.**

17 A. Consumers uses CYME as its power flow software for its LVD. This is designed to identify
18 impacts due to peak conditions across its LVD system. Planning to peak is the historical
19 means by which utilities identify system capacity needs. However, Consumers notes that
20 while AMI data is a component of its customer loads database,³⁹ the actual AMI data is not

³⁶ Ex MEC-60 (MEC-CE-1071).

³⁷ Ex MEC-68 (MEC-CE-1083).

³⁸ Ex MEC-62 (MEC-CE-1073).

³⁹ Blumenstock Direct, p. 201.

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1 uploaded into the CYME model.⁴⁰ Since CYME is designed to identify peak conditions,
2 the lack of AMI data in the model means that changes to customer demand profiles not
3 related to peak will not be identified in the model. In other words, if customer demand is
4 flattening or, with the growth of electric vehicles or solar PV, the system becomes more
5 variable, changes to planning, be it for reliability or capacity, would not necessarily be
6 captured by the CYME model. Increasingly, flexibility will be needed across the utility
7 system in response to changes in customer demand. Capturing these trends can come from
8 a number of places, including AMI data, but also from hosting capacity⁴¹ analyses and
9 interconnection requests.

10 **Q. Does Consumers explain if it using information from these other sources?**

11 A. To the best of my understanding, no. Consumers' planning processes remain largely
12 independent of each other, including being siloed within the distribution planning study.
13 The below figure from U.S Department of Energy outlines the key, iterative components
14 of a well-designed distribution system planning process, which includes not only the
15 engineering analysis, but also data from other sources, such as hosting capacity and
16 interconnection.⁴²

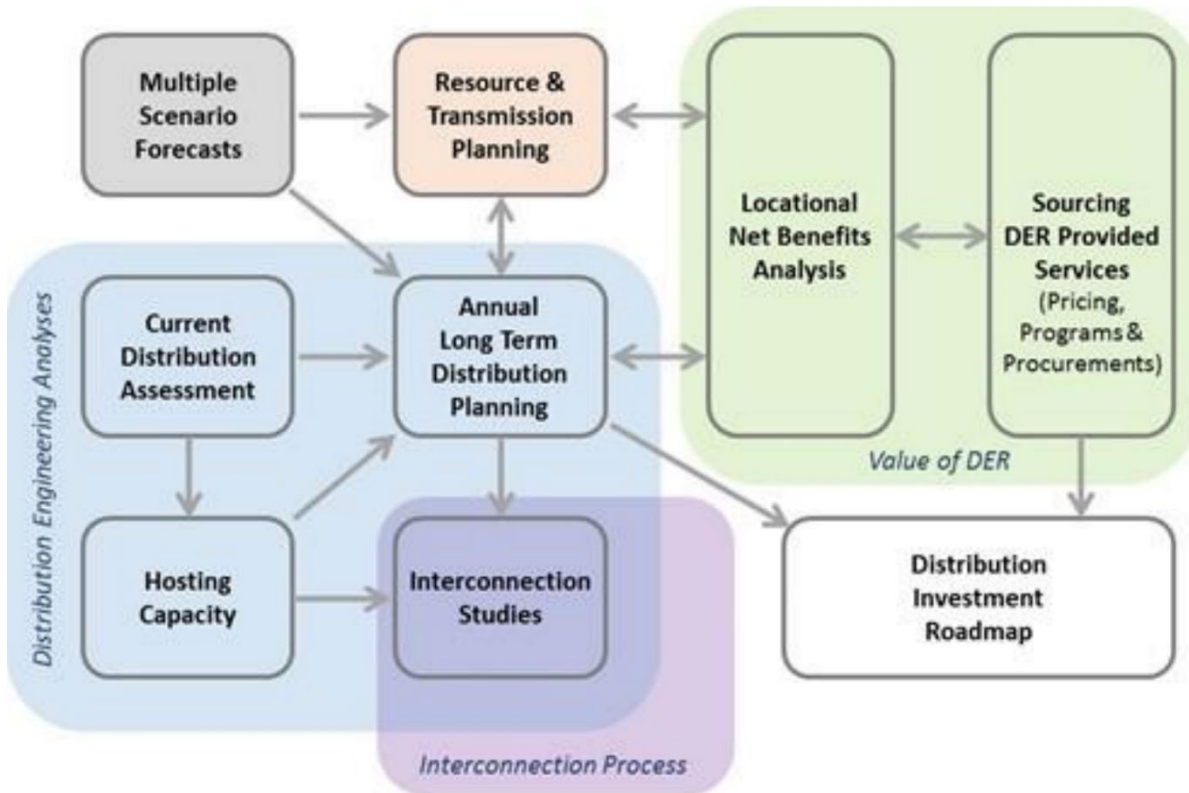
⁴⁰ Ex MEC-65 (MEC-CE-1080).

⁴¹ As defined by EPRI, hosting capacity is the amount of distributed energy resources that can be accommodated without adversely impacting power quality or reliability under current configurations and without requiring infrastructure upgrades. This is vital information to assist developers and customers have a better understanding of its capabilities to interconnect at a location. It is also an important data piece in developing a well-informed and integrated distribution planning initiative.

⁴² "Integrated Distribution Planning," Paul DeMartini, prepared for the Minnesota Public Utilities Commission, at v (August 2016).
<https://www.energy.gov/sites/prod/files/2016/09/f33/DOE%20MPUC%20Integrated%20Distribution%20Planning%208312016.pdf>

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Figure 1: Integrated Distribution Planning



1
2 This figure notes three important considerations for Consumers' planning- 1) the
3 importance of forecasting for planning, 2) the alignment with resource planning, 3) and
4 taking in data from beyond the traditional distribution planning processes. As it applies to
5 the distribution engineering analysis, Consumers does not have a substantial hosting
6 capacity program available. While that discussion is going on in other proceedings, it is
7 important to note here that the hosting capacity analysis is a valuable source of information
8 for the utility's distribution planning effort. Looking at hosting capacity only through the
9 lens of assisting the market development of solar and storage ignores the applicability of
10 hosting capacity to the utility's own planning process.

11 While Consumers does identify several HVD programs designed to respond to growing
12 numbers of interconnection requests, there is no clear evidence as to whether information

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1 from the interconnection process, such as project size or locations, are making their way
2 into other distribution planning activities. Consumers notes that DER forecasts are not
3 included in several of their program development, including LVD reliability needs.⁴³

4 **Q. You previously discussed Consumers' power flow study focusing on peak. Is that**
5 **going to be sufficient going forward?**

6 A. Peak will always be an important planning goal. However, an increasingly important
7 planning component will be providing flexibility for the system. As solar ramps up in the
8 morning and then ramps down as the sun sets, the distribution system will need to respond
9 to those relatively quick ramping periods, especially in the afternoon. Additionally, with
10 more solar and storage, net loads may result in the shifting of system peaks to other hours,
11 which may impact how transformers are sized and planned. If the system is planned for a
12 4 PM peak period, but customer demand and net load shifts that peak to 6 or 7 PM, that
13 will have an impact on operations and needs of the system. So, the system will increasingly
14 need flexibility and utilization of more flexible resources than it has historically. Simply
15 put, existing planning models and assumptions as well as investments in the system will
16 need to evolve, perhaps sooner than anticipated. That Consumers fails to account for DER
17 forecasting in several of its planning programs,⁴⁴ including reliability, means that it may
18 not be investing in the appropriate solutions, and may not be planning appropriately for the
19 future.⁴⁵

⁴³ Ex MEC-60 (MEC-CE-1071).

⁴⁴ Ex MEC-60 (MEC-CE-1071), Ex MEC-63 (MEC-CE-1074), and Ex MEC-66 (MEC-CE-1081).

⁴⁵ "Michigan Distribution Planning Framework," MPSC Staff, Docket No. U-20147 at 12-13 ("an accurate system load forecast is foundational to any distribution planning effort"). *See, also*, Case No. U-20147, Nov. 21, 2018, Order at 32 ("The Commission emphasizes the importance of accurate forecasting in planning and investment decisions and the need to ensure best practices in forecasting methods as technologies and customer behavior evolve with the adoption of DERs and PEV charging, which may include scenario-based forecasting to account for uncertainties and identify least regret solutions.").

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1 **Q. What are your recommendations for Consumers' LVD Lines Capacity program?**

2 A. The Commission is seeking its utilities to do more dynamic forecasting and modeling, and
3 that includes greater utilization of real-world data, including AMI data. Consumers
4 proposes \$11.3 million for its LVD Lines Capacity program, which is to prevent overloads
5 on its system focused on equipment upgrades and lines capacity projects associated with
6 substation projects.⁴⁶ In particular, these projects focus on addressing equipment failure at
7 substations "to reduce the risk of failure due to substation equipment reaching capacity
8 limits."⁴⁷ Again, this is a program built on incomplete information about the customer and
9 forecasts that results in \$11.3 million in new capital investments. If Consumers had
10 completed a more integrated and future oriented distribution planning process, then it may
11 have been able to identify alternative solutions to address these overloading conditions
12 through NWA or other targeted resource solutions. Lastly, since these locations are
13 identified through the use of Consumers' CYME program, it is already apparent that its
14 data sources are incomplete and not based on real-world information and dynamic
15 forecasting capabilities. I recommend that this program budget should be reduced by 50%,
16 to reflect the poorly-performed integrated distribution planning process and the failure to
17 consider available data to evaluate alternatives to this investment. Similar to its LVD
18 Substation Reliability program, this program suffers from a lack of forward planning that
19 could have identified these needs earlier. Reduction in program costs would also
20 encourage Consumers to incorporate robust, available data, look further into the future, and
21 implement an integrated distribution planning process.

22 **Q. Can you discuss your concerns with the proposed Grid Storage program?**

⁴⁶ Blumenstock Direct, p. 199.

⁴⁷*Id.* at 200.

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1 A. Yes. Witness Ozar discussed a proposed portable battery storage project, and I add to
2 Witness Ozar's concerns, but from the perspective of this project's place in Consumers'
3 distribution planning.

4 The portable battery project is estimated to cost \$8.1 million in 2021 with a primary
5 purpose of deferring a projected substation capacity upgrade by providing "peak load
6 shaving to extend the life of the substation."⁴⁸ It appears that the project would allow
7 Consumer to better understand the role and impact of a mobile battery storage system on
8 its distribution system and provide Consumers with more real world experience on using a
9 battery to engage in peak shaving to extend the life of a substation.⁴⁹ Consumers notes that
10 this battery would be able to be moved and located at a future substation where a capacity
11 expansion may be necessary.

12 If Consumers has identified locations in potential need of future upgrades, something they
13 claim is fraught with uncertainty, those locations would be relevant for potential NWA
14 options.⁵⁰ Consumers notes that the substation capacity projects identified by Witness
15 Blumenstock for 2022 were identified using a 2019 forecast. That forecast was likely
16 developed using incomplete data, at best, and also Consumers must have identified this
17 mobile battery project must in 2019.⁵¹ Yet, Consumers already anticipates potential need
18 at various identified substations in the future.

19 This battery project is representative of the disjointed and unaligned distribution process.
20 Consumers claims the NWA opportunities are too costly and they have not developed

⁴⁸ Blumenstock Direct, p. 196.

⁴⁹ *Id.*

⁵⁰ Ex MEC-66 (MEC-CE-1081).

⁵¹ *Id.*

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1 criteria for potential NWA opportunities.⁵² Yet, this particular mobile battery storage
2 project is, in essence, an NWA. This project demonstrates that Consumers is clearly able
3 to identify criteria for a potential NWA opportunity, just as long as the chosen technology
4 is its own. It also implies there are substations in the future potentially in need of a mobile
5 battery resource, which, again, implies that it does have criteria for potential NWA
6 opportunities. The portable battery project is an example of a lack of coherent, organized,
7 and aligned distribution planning across Consumers' planning initiative.

8 **Q. Can you point to any example of guidance on how to consider NWAs in distribution**
9 **plans?**

10 A. Yes. In particular, the Minnesota Public Utilities Commission, in developing distribution
11 system planning requirements for its regulated distribution utilities, explicitly require Xcel
12 Energy to describe NWA opportunities for substation investments greater than \$2
13 million.⁵³

⁵² Ex MEC-67 (MEC-CE-1082).

⁵³ *In the Matter of Distribution System Planning for Xcel Energy*, Order Approving Integrated Distribution Planning Filing Requirements for Xcel Energy, Docket No. E-002/CI-18-251, at Attachment p. 7 (August 30, 2018).

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E. Non-Wires (Non-Traditional) Alternatives Analysis

1. Xcel shall provide a detailed discussion of all distribution system projects in the filing year and the subsequent 5 years that are anticipated to have a total cost of greater than two million dollars. For any forthcoming project or project in the filing year, which cost two million dollars or more, provide an analysis on how non-wires alternatives compare in terms of viability, price, and long-term value.
2. Xcel shall provide information on the following:
 - Project types that would lend themselves to non-traditional solutions (i.e. load relief or reliability)
 - A timeline that is needed to consider alternatives to any project types that would lend themselves to non-traditional solutions (allowing time for potential request for proposal, response, review, contracting and implementation)
 - Cost threshold of any project type that would need to be met to have a non-traditional solution reviewed
 - A discussion of a proposed screening process to be used internally to determine that non-traditional alternatives are considered prior to distribution system investments are made.

The Commission should likewise require Consumers to do a similar analysis for its next 5-year distribution plan. Having this information will provide greater transparency into Consumers' distribution planning process, and will help fill that 3-5 year gap between annual rate case submissions and the 5-year distribution plan. In particular, for any infrastructure investment greater than \$1.5 million, the Commission should adopt the Minnesota Commission requirements for NWA considerations, as noted above.

Q. Do you have any concluding remarks?

A. This is the second rate case to come before the Commission from Consumers since the submission of its 2018 EDIIP—and the second time that many of these concerns with Consumers' proposed distribution spending have been raised. While, to their credit, Consumers in this rate case provides more detail about the various components of its distribution planning process and associated investments than in its prior rate case (Case No. U-20134), the utility still fails to place those needs in the context of a broader, strategic and substantiated distribution planning need. To break this cycle, I recommend that the

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Commission provide clear guidance on what, precisely, its expectations are for the distribution system; a first step would be to provide greater clarity either for upcoming utility rate cases or in the next round of 5-year distribution plans. The distribution planning goals identified by the Commission to date, with an immediate focus on safety and reliability, have failed to result in utility investments that are necessary to plan distribution investments more effectively, and in a manner than promotes lower costs for customers. In this case, Consumers largely follows an outdated – and increasingly inappropriate – historical process for identifying distribution needs through new and more capital, and does not provide any perspective around the larger, organizational evolution to a more integrated plan. Consumers is asking for an increase in spending in its distribution system, yet its planning process remains unaligned- both internally to its own distribution planning process and more broadly across the utility. Its three siloed distribution planning processes are not sufficiently aligned, does not appear to take advantage of possibilities for leveraging investments, and does not provide a foundation for the future. Furthermore, it continues to fail to identify how investments in reliability and emergent customer demands are aligned with its own 5-year distribution plan. At some point these processes must align with one another. Clear guidance from the Commission is now needed; lacking this, we will continue to confront the many issues and insufficiencies with Consumers' distribution planning that are outlined in this testimony in subsequent rate cases.

Additionally, I recommend that the Commission view Consumers' proposal for distribution spending through the lens of the current moment and the economic and health impacts that many of its customers are undoubtedly experiencing. The ongoing impacts from the COVID-19 virus continue to reveal themselves, unemployment has risen, which has a significant impact on the ability of customers to pay their bills. The investments

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1 proposed by Consumers would exacerbate an already existing crisis in Michigan and
2 around the country, and raise rates and bills across its territory, potentially increasing the
3 amount of non-payment. The Commission should apply a higher level of scrutiny to
4 Consumers' proposed distribution investments, particularly given the many concerns
5 raised in this testimony regarding misalignments in the current plan.

6 I do want to note that distribution investments can be worthwhile provided they are
7 strategic in deployment, aligned with a clear plan, are based upon a robust and transparent
8 distribution system plan, and deliver clear benefits and cleaner electricity to its customers.
9 However, when a utility notes that its own distribution expenses are increasing, yet has not
10 aligned those investments with other distribution investments or demonstrated how those
11 investments will result in specific and achievable customer benefits, then the Commission
12 should deny them. Those examples are clearly at odds with an overarching, distribution
13 system planning initiative that looks across the utility operations and leverages investments
14 to the maximum potential.

15 **Q. Please summarize your recommendations for the Commission.**

16 **A.** My recommendations are as follows:

- 17 **1. Distribution Planning should be supported by more robust data,**
18 **forecasting, and planning integration.** The Commission should question the
19 accuracy of Consumers' load forecast methodology since it is built upon
20 historical customer trends and not on the actual customer data available to it
21 from AMI. The utility has the data to generate a more accurate customer
22 forecast, including demand curves and customer profiles that will provide
23 greater insight into customer's consumption trends. The Commission should
24 require that future load forecasts be based upon customer AMI data and other

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1 data available to it from other places, such as Consumers' hosting capacity
2 analysis and its interconnection process.

3 2. **Rate case distribution investments should be considered over a longer**
4 **horizon and align with the 5-year distribution planning process.** The
5 current 5-year distribution planning cycle remains incompatible with annual
6 utility rate case submissions. The result of that is there remains a planning
7 gap between the 1-2 year rate case plan and the 5-year distribution planning
8 cycle. This means those programs and opportunities in years 3-5 are not
9 considered or explained in utility rate cases. The Commission must explicitly
10 require that Consumers must support distribution spending proposals in a rate
11 case with planning justification and forecasts beyond the immediate 1-2 years.
12 This is necessary in order to provide clarity on utility investment plans and to
13 ensure that investments proposed in a rate case is in alignment with the needs
14 over 5 years, rather than just 2 years. Absent a demonstration that the
15 spending is aligned with a 5-year window, the utility has not demonstrated
16 the reasonableness and prudence of its proposed investment.

17 3. **Consumers should be directed to consider NWA solutions.** Consumers'
18 fails to adequately and fairly consider the potential for non-wires alternatives
19 (NWA) as an alternative to infrastructure investment. Part of this is due to the
20 aforementioned misalignment between the 1-2 year planning cycle for the
21 utility's rate cases and the best practice of engaging in distribution system
22 planning on a longer 3-5 year (or longer) horizon. By looking beyond the
23 immediate 1-2 year rate case justification, NWAs would have a better chance
24 to be considered and identified as an option to defer certain infrastructure

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1 investments into the future. Additionally, realities of the existing cost of
2 service framework incentivize capital projects at the expense of other, perhaps
3 less costly options. NWAs are therefore not provided an opportunity for
4 consideration because their benefits will always be just outside the rate case
5 timeframe. The Commission should direct Consumers in its next rate case to
6 identify criteria, locations, and potential projects where NWA's may be
7 considered as a solution rather than additional capital. Meanwhile, Consumers
8 should work with stakeholders to develop criteria to identify NWA potential
9 locations, with prioritization of locations where costs to upgrade or rebuild a
10 substation are in excess of \$1.5 million.

11 4. **The Commission should disallow a portion of proposed substation**
12 **reliability upgrade and LVD line capacity costs because the Company has**
13 **not demonstrated their reasonableness with reliable data.** The Commission
14 should disallow 50% of Consumers proposed \$4.5 million to fund three new
15 or rebuilt substations in the test year and also its proposed \$11.3 million test
16 year spending for its LVD Lines Capacity program. Consumers has not
17 provided a thorough NWA review and has not supported the reasonableness
18 of these capital investments with reliable forecasts and fair consideration of
19 NWA alternatives.

20 5. **Some of Consumers' proposed grid modernization investments should be**
21 **delayed until integrated planning is demonstrated.** The Commission
22 should disallow test year funding for Consumers' ADMS and DERMS
23 programs. These are foundational technologies for a future, integrated
24 distribution system; however, Consumers has not provided any clarity or

DIRECT TESTIMONY OF CHRISTOPHER VILLARREAL
U-20697

1 explanation for how its reliability or emergent customer demand programs
2 will benefit or be integrated with these systems. Until that time, the overall
3 breadth and utilization of these technologies will be necessarily limited and
4 of minimal value to ratepayers.

5 **Q. Does that conclude your testimony?**

6 A. Yes.

CHRISTOPHER R. VILLARREAL

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(415) 680-4224

EMPLOYMENT

NON-RESIDENT (ENERGY AND ENVIRONMENTAL POLICY) ASSOCIATE FELLOW SEPTEMBER 2019-CURRENT
R Street Institute *Washington, D.C.*

- Provide regulatory and policy support on topics including performance-based ratemaking, development of rules for integrated resource planning, and market-oriented solutions for customer choice and development of clean energy resources.
- Develop written materials summarizing regulatory actions on topics related to performance-based ratemaking, customer choice, tracker reform, and other topics as needed.
- Participate in state regulatory proceedings and working groups on development of performance-based ratemaking mechanisms and integrated resource planning, including the review of utility proposals, participating in working groups to review and recommend metrics for performance-based ratemaking frameworks, and providing comments to state regulatory commissions on performance-based ratemaking metrics and frameworks.

PRESIDENT APRIL 2017-CURRENT
Plugged In Strategies *Eden Prairie, MN*

- Provide regulatory and policy analysis and consulting services related to evolution of electricity grid, distribution system planning, emerging customer and grid-connected technologies, and regulatory strategies
- Provide facilitation and moderation services for groups, workshops, and working groups
- Provide research and analysis services regarding utility and regulatory matters and structures
- Provide additional expert analysis on matters affecting electricity and regulatory structures, including topics such as data privacy, data access, rate design, interoperability, advanced technologies, performance-based ratemaking, and convergence of technology, industries, and markets.
- Provide expert testimony and presentations before state utility commissions on topics including distribution system planning, distributed energy resources, data privacy and data access, performance-based ratemaking, and grid modernization.

DIRECTOR OF POLICY MAY 2015- APRIL 2017
Minnesota Public Utilities Commission *Saint Paul, MN*

- Maintained high profile inside and outside the state representing the Commission on electricity matters
- Assisted Commissioners with policy analysis to support decision-making options
- Provided policy analysis to support development of record in proceedings
- Provided subject matter expertise on specific topics, including rate design, energy storage, grid modernization, data privacy, data access, interconnection, and security
- Organized workshops, including preparing agendas, inviting speakers, and moderating public panels
- Engaged and interact with several national organizations, including National Association of Regulatory Utility Commissioners, Department of Energy, Federal Energy Regulatory Commission, National Institute of Standards and Technologies, North American Energy Standards Board, and Smart Grid Consumer Collaborative
- Regularly spoke and participated in panels, conference, webinars, and other international, national, and state conferences on behalf of the Minnesota Public Utilities Commission
- Engaged and worked with several state-level projects, including e21 Initiative and 2025 Energy Action Plan
- Participated in actions related to Midcontinent Independent System Operator product development, including demand response and energy storage
- Chaired NARUC Staff Subcommittee on Rate Design, and managed development of Distributed Energy Resources Rate Design and Compensation manual, which included meeting specific deadlines, organize and manage a group of seven staff from around the country to develop, draft, and finalize manual on time
- Maintained an awareness and understanding of electricity policy developments across the country, including at

national and state level; provide an analysis of these developments for Commissioners

SENIOR REGULATORY ANALYST
California Public Utilities Commission

MARCH 2006- APRIL 2015
San Francisco, CA

Major Accomplishments:

- Staff lead on Commission Smart Grid rulemaking; responsible for coordinating Staff work on rulemaking, working with ALJ and Assigned Commissioner's Office, organizing and facilitating workshops on a number of Smart Grid-related topics, including cybersecurity, privacy, customer data access and other customer issues, and ensuring proceeding met legislatively mandated time-frame.
- Prepared initial Orders Instituting Rulemaking on energy storage, rate design reform, and Smart Grid, and assisted in completion of final Commission decisions on Smart Grid, rate design, customer access to data, and privacy.
- Named as a Top 50 Smart Grid Pioneers for 2013 by Smart Grid Today.
- Managed and facilitated Commission workshops on emerging topics, such as privacy, cybersecurity, energy storage, and customer data access.
- Provided lead and support analysis on many electricity issues affecting customers, market participants, and utilities, including dynamic pricing, demand response, energy efficiency, rate design, electric energy storage, direct access and retail/wholesale integration.
- Responsible for monitoring activities, preparing analyses of policies, and preparing and submitting comments related to specific subject areas before FERC, U.S. Congress, California State Legislature, CEC, DOE, NIST, and Office of Science and Technology Policy.
- Participated in standard making process, and prepared and submitted comments to FERC, NIST, and NAESB.
- Chair of NAESB Energy Services Provider Interface Task Force, and a member of NAESB Executive Committee.
- Lead author and contributor on White Papers related to several emerging topics, such as Pre-Pay, cybersecurity, and microgrids.
- Presented at conferences on updates and summaries of Commission position on Smart Grid issues, such as customer education, privacy, cybersecurity, customer access to usage, rate design and tariffs, and general regulatory policy.

PARALEGAL
Patton Boggs

NOVEMBER 2005-FEBRUARY 2006
Washington, D.C.

- Performed research at FERC, other Federal agencies, Congressional legislative history, and various state agencies.
- Cite-check, proofread, and shepardize pleadings filed at FERC and various U.S. Courts of Appeals.
- Organized and maintained discovery files.

PARALEGAL
McCarthy, Sweeney & Harkaway

JULY 2004- OCTOBER 2005
Washington, D.C.

- Performed research for FERC, other Federal agencies, U.S. Congress, state legislatures and state regulatory agencies.
- Obtained and summarized pleadings filed at FERC and courts for clients and attorneys.
- Performed energy-related research (e.g., monitor Energy news, obtain FERC and U.S. Court cases and opinions) and maintained extensive knowledge of many energy issues (e.g., RTOs, deregulation/competition, and California/Pacific Northwest refund proceedings at FERC and U.S. Courts).
- Prepared testimony and discovery-related materials for hearing before FERC Administrative Law Judge, and provided proofreading, cite-checking, and shepardizing assistance for documents filed at FERC, U.S. Supreme Court, U.S. Court of Appeals and U.S. District Courts.
- Prepared briefs and appendices, and maintained and organized case files for proceedings before FERC and U.S. Court of Appeals.

- Monitored energy-related legislation and hearings before U.S. Congress and state legislatures, as well as energy-related activities at state PUC levels (*e.g.*, electric competition/deregulation activities).

PARALEGAL

MARCH 2003- JUNE 2004

Duane Morris, LLP

Washington, D.C.

- Performed research at FERC and other Federal agencies. Monitored FERC meetings and prepared summaries of meeting for attorneys and clients.
- Obtained and summarized pleadings filed at FERC and courts for clients and attorneys.
- Performed energy-related research (*e.g.*, monitor Energy news, obtain FERC and U.S. Court cases and opinions) and maintained knowledge base on many energy issues (*e.g.*, RTOs, deregulation/competition, and California/Pacific Northwest refund proceedings at FERC and U.S. Courts).
- Prepared testimony and discovery-related materials for hearing before FERC Administrative Law Judge, and provided proofreading, cite-checking, and shepardizing assistance for documents filed at FERC, U.S. Supreme Court, U.S. Court of Appeals, and U.S. District Courts.
- Monitored energy-related legislation and hearings before U.S. Congress and state legislatures, as well as energy-related activities at state PUC levels (*e.g.*, electric competition/deregulation activities).

LEGAL ASSISTANT

APRIL 2001-MARCH 2003

McGuireWoods LLP

Washington, D.C.

- Performed research at FERC and other Federal agencies. Monitored FERC meetings and prepared summaries of meeting for attorneys and clients.
- Performed energy-related research (*e.g.*, monitor energy news, obtain FERC and U.S. Court cases and opinions) and responsible for monitoring energy issues for attorneys (*e.g.*, RTOs, deregulation/competition, generation interconnection, and California/Pacific Northwest refund proceedings at FERC and U.S. Courts).
- Prepared testimony and discovery-related materials for hearing before FERC Administrative Law Judge, and provided proofreading, cite-checking, and shepardizing assistance for documents filed at FERC, U.S. Supreme Court, U.S. Court of Appeals for D.C. Circuit and 9th Circuit, and U.S. District Court for D.C.
- Monitored energy-related legislation and hearings before U.S. Congress and state legislatures, as well as energy-related activities at state PUC levels (*e.g.*, electric competition/deregulation activities).

ENERGY SPECIALIST

MARCH 1998- APRIL 2001

Verner, Liipfert, Bernhard, McPherson, & Hand

Washington, D.C.

- Performed research at FERC, SEC, Library of Congress, U.S. Congress, NRC, Department of Interior, National Archives, EPA, U.S. Supreme Court, U.S. Court of Appeals for D.C. Circuit, U.S. District Court for D.C., and other state agencies.
- Performed and monitored energy and environmental-related research.
- Made filings at FERC, U.S. Court of Appeals for D.C. Circuit, U.S. District Court for D.C., and SEC.
- Provided proofreading assistance, including cite-checking and shepardizing of documents.
- Attended U.S. Congress hearings on Energy issues and summarized for attorneys.
- Organized and maintained Energy Group library and trade press.
- Supervised Energy Group Summer intern.

EDUCATION

BACHELOR OF ARTS IN HISTORY
Baylor University

1993-1997
Waco, Texas

ASSOCIATIONS

- Board of Directors, Minnesota Conservative Energy Forum
- Associate Member, GridWise Architecture Committee

- Planning Commission, City of Eden Prairie, MN (2017-2020)
- Board of Directors, Emeritus, North American Energy Standard Board
- Executive Committee, Emeritus, Retail Markets Quadrant, North American Energy Standards Board
- Board of Directors, Emeritus, Smart Grid Consumer Collaborative
- Chair, Staff Subcommittee on Rate Design, National Association of Regulatory Utility Commissioners (November 2015-April 2017)
- Co-Chair, Business and Policy Domain Expert Working Group, Smart Grid Interoperability Panel (2014-2016)

PUBLICATIONS

- *Smart Grid Interoperability: Prompts for State Regulators to Engage Utilities*, National Association of Regulatory Utility Commissioners (April 2020).
<https://pubs.naruc.org/pub/28950636-155D-0A36-313C-73CCEA2D32C1>
- *Framework and Roadmap for Smart Grid Interoperability Standards Regional Roundtables Summary Report*, NISTIR 8284, National Institute of Standards and Technology, *et al.* (February 2020).
<https://doi.org/10.6028/NIST.IR.8284>
- *Distributed Energy Resources Rate Design and Compensation Manual*, National Association of Regulatory Utility Commissioners, Staff Subcommittee on Rate Design (November 10, 2016).
<http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0>
- *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, Policy and Planning Division (April 14, 2014).
<http://www.cpuc.ca.gov/NR/rdonlyres/01ECA296-5E7F-4C23-8570-1EFF2DC0F278/0/PPDMicrogridPaper414.pdf>
- *Utility Investment Valuation Strategies: A Case for Adopting Real Options Valuation*, California Public Utilities Commission, Policy and Planning Division (October 3, 2013).
<http://www.cpuc.ca.gov/NR/rdonlyres/D5C63A2B-40F2-468D-964A-F265B90346B1/0/Final2RRM.pdf>
- *Cybersecurity and the Evolving Role of State Regulation: How it Impacts the California Public Utilities Commission*, California Public Utilities Commission, Grid Planning and Reliability/Policy and Planning Division Policy Paper (September 19, 2012).
<http://www.cpuc.ca.gov/NR/rdonlyres/D77BA276-E88A-4C82-AFD2-FC3D3C76A9FC/0/TheEvolvingRoleofStateRegulationinCybersecurity9252012FINAL.pdf>
- *A Review of Pre-Pay Programs for Electricity Service*, California Public Utilities Commission, Policy and Planning Division Policy Paper (July 26, 2012).
<http://www.cpuc.ca.gov/NR/rdonlyres/152ED1D4-DD85-4D6F-984B-B84847933A18/0/Prepaypolicypaper0712.pdf>
- *Electric Energy Storage: An Assessment of Potential Barriers and Opportunities*, California Public Utilities Commission, Policy and Planning Division (July 9, 2010).
<http://www.cpuc.ca.gov/NR/rdonlyres/71859AF5-2D26-4262-BF52-62DE85C0E942/0/CPUCStorageWhitePaper7910.pdf>

TESTIMONY

- *In the matter of the application of Consumers Energy Company for authority to increase its rates for the generation and distribution*, Direct Testimony of Christopher Villarreal on Behalf of Michigan Environmental Council, Natural Resources Defense Council, and Sierra Club, before the Michigan Public Service Commission, Case No. U-20134 (September 10, 2018)
<https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000002ftVkAAI>
- *In the matter of the application of DTE ELECTRIC COMPANY for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority*, Direct Testimony of Christopher Villarreal on Behalf of Michigan Environmental Council, Natural Resources Defense Council, and Sierra Club, before the Michigan Public Service Commission, Case No. U-20162 (November 7, 2018)
<https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000329ckAAA>
- *Application of Duke Energy Carolinas, LLC for Adjustments in Electric Rate Schedules and Tariffs and Request for an Accounting Order*, Direct Testimony of Christopher Villarreal on Behalf of South Carolina Solar Business Alliance, before the Public Service Commission of South Carolina, Docket No. 2018-319-E (February 26, 2019)
<https://dms.psc.sc.gov/Attachments/Matter/499c7e9c-65b6-4469-afbd-9d7614711b84>
- *Application of Duke Energy Progress, LLC for Adjustments in Electric Rate Schedules and Tariffs and Request for an Accounting Order*, Direct Testimony of Christopher Villarreal on Behalf of South Carolina Solar Business Alliance, before the Public Service Commission of South Carolina, Docket No. 2018-318-E (March 1, 2019)
<https://dms.psc.sc.gov/Attachments/Matter/ce0917d7-35f2-4bb0-8715-5c2345a5026c>
- *In the matter of the Application of Indiana Michigan Power Company for authority to increase its rates for the sale of electric energy and for approval of depreciation rates and other related matters*, Direct Testimony of Christopher Villarreal on Behalf of the Environmental Law and Policy Center, the Ecology Center, the Solar Energy Industries Association, and Vote Solar, before the Michigan Public Service Commission, Case No. U-20359 (October 17, 2019)
<https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t00000077IYRAA2>
- *In the matter of the Application of DTE Electric Company for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority*, Direct Testimony of Christopher Villarreal on Behalf of the Environmental Law & Policy Center and the Natural Resources Defense Council, before the Michigan Public Service Commission, Case No. U-20561 (November 6, 2019)
<https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000007X6ZiAAK>

Question:

15. Please describe the extent to which Consumers Energy has used AMI data to:
- Identify and correct phase imbalance in three-phase distribution lines?
 - Identify and relocate or replace line transformers that are over-sized or under-sized?
 - Identify portions of the distribution system with higher frequency violation of voltage range and initiate corrective action?
 - Identify portions of the distribution system with low power factor and initiate corrective action?
 - Identify low-voltage faults or power quality problems and initiate corrective action?

Response:

- The Company does not use AMI data to identify and correct phase imbalances in three-phase distribution lines.
- Reference page 220, lines 11 through 14, of my direct testimony. The Company utilizes AMI data to ensure customers are served with acceptable voltages as part of the CVR program. If AMI data analysis indicates a low voltage issue, voltage-drop and flicker calculations are performed to verify the secondary transformer and conductor are sized correctly for peak load. If it is determined that either are under-sized, corrective action is taken to complete upgrades.
- The Company utilizes AMI data to identify customers that receive voltage outside of allowable limits and to evaluate customer complaints. The CVR program monitors daily AMI meter voltage readings on CVR circuits. If voltage deviations are found to occur with high frequency, the Company ensures corrective actions are taken to remediate the issue within a reasonable time period.
- AMI data is not used to identify low power factor on the distribution system.
- AMI meters are designed to measure energy consumption for billing purposes. AMI meters do log events like a complete loss of power, but they do not capture sub-cycle disturbances indicative of power quality issues.



RICHARD T. BLUMENSTOCK
June 1, 2020

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Question:

22. Reference testimony of Witness Blumenstock, page 82, lines 5-17:

- a. Were the transformer failures at Eden and Pasadena previously identified by Consumers as in need of replacement prior to 2017?
- b. What was the age of the equipment that failed?
- c. Has Consumers identified potential transformer replacements beyond 2022?
- d. How has Consumers identified which transformers need replacement in this rate case compared to those in the future? Please explain your response.

Response:

This question appears to refer to page 83, lines 5 through 17, of my direct testimony. On that assumption, the responses are as follows:

- a. The Pasadena Transformer Bank #2 was the second most deteriorated HVD transformer based on Dissolved Gas-In-Oil Analysis (DGA) results prior to 2017. Accumulations of certain gases, or combinations thereof, provide good indicators of the condition of the internal dielectric (insulation) condition. Results had assigned it a TOA4 (Transformer Oil Analyst – DeltaX) Condition Code of 4 (1 is good, 4 is bad). The Vrooman Transformer Bank #1 was the most deteriorated HVD transformer at that point, but with its replacement in 2016-2017 the Pasadena transformer then became the most deteriorated bank.

The Edenville Transformer Bank #1 replacement was not planned. The bank experienced a lightning strike on April 30, 2017, causing a catastrophic failure of a bushing, resulting in molten metal from the bushing being deposited in the bank. This compromised the integrity of the internal insulation system of the bank, requiring its replacement.

- b. The Pasadena transformer was manufactured in 1970. The Edenville transformer was manufactured in 1950.
- c. The Company has not identified potential transformer replacements beyond 2022. The Company monitors DGA test results of transformers and identifies those which have deteriorating DGA conditions. Replacement plans are typically made in the year prior to a planned project based on the most recent data available. There are tentative plans to replace deteriorating HVD transformers at a rate of approximately one to two per year, depending on the latest test results.
- d. The identification process for HVD transformer replacement candidates follows the process described above. The process used for this rate case is expected to be used in years going forward as well.



RICHARD T. BLUMENSTOCK
June 1, 2020

Question:

25. Reference testimony of Witness Blumenstock, page 90, lines 10-12:

- a. Please describe how Consumers is projecting future projects and budgets beyond 2021.
- b. Please describe how customer demand impacts those future projects and budgets.
- c. Please describe how forecasting of DER growth impacts those future projects and budgets.

Response:

- a. In the LVD Transformers Demand Failures sub-program, which is being discussed in the referenced section of testimony, the Company does not project future projects. The Company's approach to projecting future budgets is addressed in discovery response 20697-ST-CE-377. The allocation of the total transformers purchase plan among LVD Transformers New Business, LVD Transformers Demand Failures, and LVD Transformers Capacity, is done on a retrospective basis as described on page 64, lines 10 through 17, of my direct testimony.
- b. In the LVD Transformers Demand Failures sub-program, which is being discussed in the referenced section of testimony, the Company does not project future projects. Customer demand does not directly impact the Company's projected future LVD Transformers budget.
- c. In the LVD Transformers Demand Failures sub-program, which is being discussed in the referenced section of testimony, the Company does not project future projects. Forecasting of DER growth impacts does not impact the Company's projected future LVD Transformers budget.



RICHARD T. BLUMENSTOCK

June 1, 2020

Question:

28. Reference testimony of Witness Blumenstock, page 110, lines 9-16:

- a. Please describe the circumstances when Consumers might change their plan.
- b. Please describe how Consumers identifies potential Reliability Program investments, including the type of projects it considers, how far into the future it plans, and how changes to demand forecasting impact those plans.

Response:

- a. The Company may reprioritize work when conditions indicate, through inspections, circuit performance, or other measures, that a given project needs to be addressed sooner than originally anticipated. An example is given on page 129, line 17, through line 130, line 2, of my direct testimony.
- b. The Company identifies Reliability program investments in varying ways specific to given sub-programs and investment categories, as I describe in each respective sub-program's section of my testimony. Demand forecasting is generally not used in Reliability planning; issues created by demand forecasts are addressed in the Capacity program.



RICHARD T. BLUMENSTOCK

June 1, 2020

Electric Planning

Question:

30. Reference testimony of Witness Blumenstock, page 121, line 23-page 121, line 6:

- a. Please describe how load growth and demand forecasts impact the plan and identification of projects.
- b. Please describe how load growth and demand forecasts impact future line reliability projects, including timelines for projects.

Response:

The referenced lines of my direct testimony discuss the HVD Lines Reliability sub-program.

- a. Load growth and demand forecasts are not used as an input when identifying HVD Lines Reliability projects.
- b. Load growth and demand forecasts do not impact these projects. HVD Lines Reliability projects are broadly used to address situations of asset deterioration; load is not a factor in this deterioration.



RICHARD T. BLUMENSTOCK

June 1, 2020

Electric Planning

Question:

32. Reference testimony of Witness Blumenstock, page 133, line 17- page 134, line 12:

- a. Please describe how Consumers utilizes customer demand forecasts and DER forecasts in its analysis.
- b. Please describe how Consumers uses AMI data about customer usage in inform its planning process.
- c. Please identify how far into the future Consumers plans.

Response:

The referenced section of my direct testimony relates to the LVD Substations Reliability sub-program. The following relate to that sub-program:

- a. The Company evaluates customer demand forecasts when building new substations and rebuilding existing substations in order to ensure correct substation design and equipment sizing that is appropriate to the future demand needs of an area. The Company does not use DER forecasts in planning LVD Substations Reliability projects because such forecasts do not provide sufficient certainty needed to address reliability concerns when new substations are being evaluated, and would not be relevant to the other investment categories in this sub-program (animal mitigation, mobile substations, etc.).
- b. AMI data is not used in planning LVD Substations Reliability projects.
- c. LVD Substations Reliability projects are typically identified within two years of when they are needed. When evaluating new LVD substations, the Company typically considers 10 years of forecasted load data.



RICHARD T. BLUMENSTOCK

June 1, 2020

Question:

33. Reference testimony of Witness Blumenstock, page 134, lines 15-23:

- a. For Consumers' consideration of non-wires alternatives, did Consumers consider NWA potential for locations 4 to 5 years in the future? Please explain your response.
- b. How is Consumers using load growth and customer demand forecasts to identify potential locations for NWAs?

Response:

- a. As discussed on page 134, lines 15 through 23, of my direct testimony, the Company is not yet considering non-wires alternatives for LVD Substations Reliability investments, as the Company is still working to establish well-defined costs, deployment schedules, and reliability parameters for non-wires alternatives.
- b. The Company is not yet looking for potential NWA locations for LVD Substations Reliability projects. The selection criteria used for identifying the Company's two NWA pilot locations, which is described on page 213, lines 1 through 5 of my direct testimony, is representative of how future NWA locations will be identified in the future.



RICHARD T. BLUMENSTOCK

June 1, 2020

Question:

34. Reference testimony of Witness Blumenstock, page 135, line 11- page 136, line 14:

- a. What system operational data does Consumers collect from its AMI system?
- b. Please describe how Consumers uses the system operational data in its planning process, including the identification of needs and locations across its LVD.

Response:

- a. The Company collects the total kilowatt-hours (kWh) delivered, the total kWh received, the total kilovolt-amperes-reactive-hours (kvarh) delivered, the total kvarh received, and the average voltage over the meter reading interval. The reading interval for single-phase meters is hourly and the reading interval for polyphase meters is every fifteen minutes. The Company also collects operational meter event data. Some event codes such as power down, power up, and tamper alert are sent by the meter in real time. Other event codes such as communication status or time sync status are stored and collected overnight along with the interval reading data.
- b. AMI data is not used in the planning of LVD Substation Reliability projects, which is the sub-program being discussed in the referenced section of my direct testimony. While LVD Substation planning may refer to AMI data on occasion to troubleshoot a specific LVD substation problem, this is not a common occurrence.



RICHARD T. BLUMENSTOCK

June 1, 2020

Electric Planning

Question:

35. Reference testimony of Witness Blumenstock, page 139, line 13- page 140, line 6: Please describe how customer demand forecasts, customer load impacts, DER forecasts, and AMI data are used in developing its Criticality, Health, and Risk ("CHR") analytic algorithm.

Response:

The specific items in the question – customer demand forecasts, customer load impacts, DER forecasts, and AMI data, are not used in the CHR algorithms.

CHR algorithms are only applied to specific equipment types of equipment and vary by equipment type due to customization. Where applied, the algorithms are used to determine individual component risk by utilizing a system criticality assessment for each individual piece of equipment based in part on position and available redundancy, and the health of each of these pieces of equipment based on specific data from test results. Reliability engineers may then use this risk assessment along with other relevant data to develop reliability project plans.



RICHARD T. BLUMENSTOCK

June 1, 2020

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Question:

40. Reference testimony of Witness Blumenstock, page 181, line 26- page 182, line 2:

- a. Has Consumers identified any substations in need of repair or replacement for 2022-2026? Please provide supporting documentation.
- b. Please explain how Consumers identifies whether and when a substation needs repair or replacement.

Response:

Page 181, line 26, through page 182, line 2, of my direct testimony refers to situations in which the Company may rebuild a substation, effectively replacing the existing substation with a new one.

- a. The Company has not, at this time, identified any substation replacement projects for the 2022 through 2026 timeframe in the LVD Substations Rehabilitation sub-program.
- b. The Company identifies substation replacement projects based on its inspections and corresponding engineering judgment, as discussed on page 178, line 1, through page 180, line 6.



RICHARD T. BLUMENSTOCK
June 1, 2020

Electric Planning

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Question:

41. Reference testimony of Witness Blumenstock, page 201, lines 13-20: What types and granularity of customer meter information does Consumers use as an input to CYME? For example, does Consumers utilize AMI to collect the amps, voltage, and var at a customer's premise?

Response:

The Company does not import AMI data directly into CYME. The Company utilizes AMI to collect customer energy consumption (kWh) which is aggregated at the transformer level and converted to a peak demand. This is stored in the Company's transformer load history database and is then matched to the circuit model to create its CYME studies.



RICHARD T. BLUMENSTOCK

June 1, 2020

Electric Planning

Question:

42. Reference testimony of Witness Blumenstock, page 202, lines 5-9:

- a. Does the power flow study include customer load forecasts and DER forecasts in its analysis? Please explain your response.
- b. How far into the future does the power flow study look?
- c. Can Consumers identify potential upgrades to the LVD line capacity 5 or more years in the future? Please explain your response.

Response:

- a. The Company's standard analysis for LVD power flow, that is run in CYME, is for peak circuit load. DER forecasts are not simulated unless the LVD planner is aware of, and manually adds, the DER to their study.
- b. The study is a snapshot in time of peak load experienced on the circuit, typically within the last year. The analysis performed on the study can be adjusted to look forward as many years as the Company chooses. Currently, studies look out three years from the base case for evaluation of future capacity projects. For example, 2022 capacity projects are proposed using a study forecasted from 2019 peak loads.
- c. The Company can identify potential upgrades to the LVD line capacity five or more years in the future. Evaluating too far in the future reduces accuracy of the study due to inaccuracies in multi-year forecasting. The Company evaluates the need closer to the estimated year of the required upgrade and adjusts the planned project if a more recent study shows differences from the original forecast.



RICHARD T. BLUMENSTOCK
June 1, 2020

Electric Planning

Question:

43. Reference testimony of Witness Blumenstock, page 212, line 17- page 212, line 9: Please describe Consumers' criteria for identifying potential NWA opportunities, and the types of technologies Consumers considers for NWA opportunities.

Response:

Page 212, line 17, through page 213, line 9, of my direct testimony describes the Company's use of two specific pilot programs used by the Company to test the use of targeted energy efficiency and demand response as NWA options. Beyond what is provided in testimony, details on these pilots were provided in discovery response 20697-ST-CE-422. These pilot programs represent the Company's exploration into NWA opportunities and technologies. Since the application of NWAs is in its early stages, the Company has not established criteria for NWA application or targeted technologies.



RICHARD T. BLUMENSTOCK
June 1, 2020

Electric Planning

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Question:

44. Reference testimony of Witness Bruering, page 6, lines 14-15:

- a. Please explain the “end-use techniques” used to develop the demand and peak forecasts.
- b. Please explain how AMI data is used as part of developing the customer forecasts.

Response:

- a. Referring to my direct testimony, page 7, lines 1-6, projected electric deliveries (sales) include certain end-use analyses, meaning that these reside outside of the econometric process (regression modeling), which are used in the modeling of the Company’s system peak demands (see “first step,” page 7 of direct testimony).
- b. AMI data are not used as part of developing the customer forecasts.



Eugène M. Breuring
June 1, 2020

Rates and Regulation Department

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of
CONSUMERS ENERGY COMPANY for
authority to increase its rates for the
generation and distribution of electricity and
for other relief.

U-20697

ALJ Sally Wallace

PROOF OF SERVICE

On the date below, an electronic copy of **Direct Testimony of Christopher Villarreal and Exhibits MEC-54 through MEC-68** on behalf of **Michigan Environmental Council, Natural Resources Defense Council, Sierra Club and Citizens Utility Board of Michigan** were served on the following:

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[signature page follows]

The statements above are true to the best of my knowledge, information and belief.

OLSON, BZDOK & HOWARD, P.C.
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Date: June 24, 2020

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