Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company
for Authority to Increase Rates for Electric Service in Minnesota

Docket No. E002/GR-21-630
Exhibit___(MOR-1)

Business Systems

October 25, 2021

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Schedules

I. INTRODUCTION

1   **I. INTRODUCTION**

2

3   Q.   PLEASE STATE YOUR NAME AND OCCUPATION.

4   A.   My name is Michael O. Remington. I am currently serving as the Business

5   Systems Regulatory Director, Advanced Grid, for Xcel Energy Services Inc.

6   (XES), the service company affiliate of Northern States Power Company, a

7   Minnesota corporation (NSPM or the Company) and an operating company of

8   Xcel Energy Inc. (Xcel Energy). I have been in my current position since

9   January 31, 2021.

10

11   Q.   PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

12   A.   I am currently responsible for directing and preparing testimony, supporting

13   documents, and discovery responses related to Business Systems in filings

14   before the Minnesota Public Utilities Commission (Commission) as well as for

15   other Xcel Energy operating companies (OpCos). I am also responsible for the

16   regulatory aspects of Business Systems' role in the Advanced Grid Intelligence

17   and Security (AGIS) initiative.

18

19   Overall, I have over 20 years of experience in the field of IT, which includes my

20   career at Xcel Energy. After almost eight years at IBM Global Services, where

21   I filled IT roles under contract for Xcel Energy, I joined Xcel Energy in July

22   2008 as a Senior Manager of IT Service Management, where I served

23   continuously for 11 years. My team was responsible for the administration of

24   core IT service management processes (change, problem, request fulfillment,

25   configuration and asset management). We also ensured compliance and audit

26   readiness for several North American Electric Reliability Corporation (NERC)

27   regulatory standards and Sarbanes-Oxley Act of 2002 controls. From October

1   2013 to January 2015, in addition to my role as Senior Manager of IT Service

2   Management, I served on temporary assignment in the General Counsel

3   organization where I practiced law on behalf of Xcel Energy, including

4   transactional work and equal employment opportunity and safety investigations.

5   From July 2019 to January 31, 2021, I was Director of IT Operations. In that

6   role, I was responsible for managing major incidents, monitoring Information

7   Technology (IT) infrastructure and applications, disaster recovery planning, and

8   managing several core IT service management processes.

9

10   My résumé is attached as Exhibit___(MOR-1), Schedule 1.

11

12 **Q.** WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

13 **A.** I present and support the Company's capital and operation and maintenance

14   (O&M) budgets during the period of the 2022-2024 multi-year rate plan

15   (MYRP) for the Business Systems area.

16

17 **Q.** PLEASE PROVIDE AN OVERVIEW OF THE BUSINESS SYSTEMS AREA WITHIN XCEL

18   ENERGY.

19 **A.** Business Systems provides IT services across Xcel Energy. Like all utilities,

20   Xcel Energy must invest in computers, software, networks, mobile devices and

21   other IT services each year in order to (among other things):

22   • Coordinate work in the field;

23   • Interact with customers;

24   • Operate and dispatch generation facilities;

25   • Run our transmission system;

26   • Provide information to our state and federal regulators;

27   • Purchase fuel;

1   • Bill and collect efficiently;

2   • Develop budgets and track expenditures;

3   • Manage vendors and vendor contracts; and

4   • Pay employees.

5

6   Each of these activities is necessary to provide reliable electric service and a

7   positive customer experience.

8

9   Q.   CAN YOU PROVIDE AN OVERVIEW OF THE WORK BUSINESS SYSTEMS WILL BE

10   PERFORMING OVER THE NEXT FEW YEARS?

11 A.   Yes. Over the next three years, Business Systems will continue much of our

12   fundamental IT work, including replacing aging technology; protecting

13   customers and the Company against cyber security risks and attacks; and

14   strategically enhancing our IT capabilities to improve our customer and

15   employee experiences.

16

17   This ongoing, fundamental IT work is necessary because technology changes

18   constantly. With typical asset lives ranging from three to seven years (depending

19   on the system), the average lifespan of IT assets is considerably shorter than it

20   is for assets in many other business areas. Although we have been able to return

21   great value from our larger systems, IT assets need frequent attention in order

22   to keep up with changes in technology and corresponding changes in customer

23   expectations. We will continue to be flexible and nimble, working within the

24   resources available to us, to address new technologies and needs as they emerge.

25   With respect to replacing aging technology, we not only continue to focus on

26   making sure our employees have the technology tools necessary for the

27   provision of electric service to customers, but we invest in projects that will

1   transform business areas. While some of these tools (e.g., desk and laptop

2   computers, mobile phones, software versions) need to be patched, updated, or

3   replaced on a reasonably regular basis, in other areas we have been able to

4   strategically harvest maximum value from older systems and delay investments.

5

6   In addition to keeping technology updated, we need to maintain the security of

7   data belonging to our customers, our employees, and our business. Knowing

8   that we will continue to identify new cyber security risks over the next several

9   years, we must proactively make the necessary investments to ensure data

10   security.

11

12   Moreover, we also have the opportunity to enhance our capabilities and become

13   more efficient. As an example, in 2018 we implemented Blue Prism Process

14   Automation in the financial operations area, which leverages automation

15   technologies in order to streamline workloads. This helps ensure a better, more

16   efficient, and faster financial close process by leveraging technology to

17   maximize our employees' time.

18

19   Additionally, in an era when customers' expectations are higher than they have

20   ever been, we are also focusing on enhancing our customers' experience with

21   their utility and electric service by leveraging data, as well as interactive

22   technology through the web and digital interfaces, to improve our customers'

23   options for energy usage, monitoring, and services. We are continuing on an

24   enterprise-wide effort to advance and modernize the Xcel Energy customer

25   experience, including updating existing systems such as our website and

26   MyAccount through our Customer Experience Transformation programs, and

1	enhancing the electric distribution grid and associated customer services with
2	an eye toward the future through our AGIS initiative.
3	
4	Q. PLEASE PROVIDE A SUMMARY OF YOUR TESTIMONY.
5	A. In my Direct Testimony, I describe the Business Systems organization, as well
6	as some of the IT and business continuity services we provide. I illustrate that
7	our capital and O&M investments have increased in light of the rising
8	importance of IT in our business. I explain the kinds of investments we are
9	currently making, why they are important to meet our customers' changing
10	energy needs, and how we work to ensure reasonable costs for those
11	investments.
12	
13	I present our proposed capital additions of approximately $115.6 million for
14	2022, $196.0 million for 2023, and $89.2 million for 2024 on a NSPM (Total
15	Company) basis.[1] I provide support for the key investments we seek to recover
16	in base rates during the MYRP term (2022-2024).
17	
18	I begin by walking through the major capital projects that comprise these rate
19	case budgets, organizing projects according to the following budget groupings:
20	(1) aging technology, (2) cyber security, (3) customer experience, (4) enhancing
21	capabilities, and (5) emergent demand.
22	
23	I then discuss the Business Systems O&M budget for 2022 through 2024, which
24	is driven by employee labor and non-labor costs, software maintenance, shared

---

[1] All costs for capital additions in my testimony are stated on a NSPM (Total Company) basis, including electric and common unless otherwise noted. Capital projects that would be only assigned to the State of Minnesota Gas jurisdiction are not included. As discussed in more detail below, Business Systems O&M costs are presented for the NSPM Electric jurisdiction.

1   assets, and network communications. I explain why our O&M budget is

2   reasonable and reflects the types of expenditures we must make to keep the

3   technology side of our business running productively.

4

5   Q. HOW HAVE YOU ORGANIZED YOUR TESTIMONY?

6   A. My testimony is organized into the following sections:

7   • *Section II* – Business Systems Overview

8   • *Section III* – Capital Investments

9   • *Section IV* – O&M Budget

10   • *Section V* – Conclusion

11

12   **II. BUSINESS SYSTEMS OVERVIEW**

13

14 Q. PLEASE DESCRIBE BUSINESS SYSTEMS' KEY ROLES AND RESPONSIBILITIES.

15 A. Business Systems is the Company's centralized IT organization, providing

16   technology services across all operating companies, including NSP-Minnesota.

17   These services include support for the following business operations:

18   • *Foundational Technology Infrastructure.* Business Systems is responsible for

19   providing support for each employee's hardware and software needs.

20   This includes maintaining and updating the operating system used on

21   employee computers and providing sufficient data storage capabilities.

22   Business Systems is also charged with protecting the security of the

23   Company's data from cyber attacks.

24   • *Systems Controls.* Business Systems provides technology support to our

25   generation, transmission, and distribution units to help manage and

26   operate the electric and gas systems. This includes providing and

27   supporting software applications such as Supervisory Control and Data

1   Acquisition (SCADA), which is used to monitor the health of the

2   transmission and distribution systems.

3   • *Customer Support.* We provide support for infrastructure and software that

4   facilitate interactions with our customers. This includes maintaining the

5   Customer Resource System (CRS), which is the Company's customer

6   information system of record, which generates approximately 4 million

7   billing statements to Xcel Energy customers on a monthly basis. We also

8   support the Interactive Voice Response (IVR) software that enables

9   interaction with customers via telephone keypad or speech recognition.

10   Business Systems is also responsible for maintaining the technology used

11   for the Company's website that provides valuable information to

12   customers about their accounts and Company operations including

13   outages.

14   • *Corporate Support.* We provide IT support for necessary corporate

15   functions of the Company such as Human Resources and Financial

16   Management. This includes providing and maintaining software

17   applications that assist in the creation, tracking, reporting, and analysis of

18   budget and forecast information.

19

20 Q. HOW DOES BUSINESS SYSTEMS SUPPORT THE SERVICES OR FUNCTIONS

21   DESCRIBED ABOVE?

22 A. Along with our day-to-day work to support the IT we have deployed, Business

23   Systems makes capital investments and incurs O&M costs to support other

24   business areas and functions across Xcel Energy as discussed above. I will

25   discuss our capital investments and O&M trends in more detail below.

1   Q. WHY IS BUSINESS SYSTEMS IMPORTANT TO THE COMPANY AND ITS CUSTOMERS?

2   A. Business Systems provides the technologies and supporting services necessary

3   for system reliability and security, operational decision-making, and improved

4   customer support and business capabilities. Technology is constantly advancing

5   and evolving as a foundational aspect necessary to help any business meet its

6   goals and objectives.

7

8   To operate in such an environment, we must be smart and proactive by

9   identifying and integrating technologies that will both advance our business and

10   protect it from technological attacks. For example, the advancements in two-

11   way communications, intelligent devices, and SCADA necessitate the

12   integration of many systems to ensure effective use of information and enable

13   operational capabilities of new technologies. Identifying new technologies and

14   integrating them into our system supports a smarter grid, system optimization,

15   a more effective workforce with better-enabled employees, and more informed

16   stakeholders through closer connections with external parties. These

17   developments increase the importance of technology, and in turn Business

18   Systems, to the Company and each of our stakeholders.

19

20   **III. CAPITAL INVESTMENTS**

21

22   **A.   Overview**

23   *1.   2018-2020 Business Systems Capital Additions*

24 Q. WHAT WERE THE DRIVERS OF BUSINESS SYSTEMS' CAPITAL INVESTMENTS OVER

25   THE PAST FEW YEARS, FROM 2018 TO 2020?

26 A. Over the past few years, due to the aging nature of our IT systems, changing

27   business and regulatory requirements, and evolving technologies, the Company

1   continued phased replacements and upgrades to the Company's systems.

2

3 Q. WHAT SYSTEM UPGRADES AND REPLACEMENTS HAS THE COMPANY

4   UNDERTAKEN DURING THE 2018-2020 PERIOD?

5 A. We have continued to invest in routine aging technology refreshes as well as

6   projects to address outstanding business needs, including cyber security and

7   enhancing our capabilities. We have also significantly enhanced our focus on

8   customer experience as changing customer expectations are requiring us to

9   work to continuously improve and maximize the performance of the tools

10   serving customers. Although the Company does not seek recovery of AGIS

11   costs in base rates, Business Systems is also continuing work on our AGIS

12   initiative and integrating customer programs to enhance the customer

13   experience.

14

15   In addition, our aging network infrastructure was (and continues to be) a key

16   driver of increased investment and requires attention on an ongoing basis.

17   Network connectivity is a critical operational foundation required for the

18   Company to provide a safe and reliable product. Failure to replace aging

19   network mechanisms would increase the risk of component level failures

20   resulting in systemic outages across service venues.

21

22   Significant specific Business Systems aging projects included replacement of

23   aging network components and the Microsoft Next Generation project (a major

24   Microsoft Windows operating system upgrade from Windows 7 to Windows

25   10), which required entensive application testing and in some cases application

26   upgrades. This is because upgrading operating systems is complex and generally

27   requires extensive testing of current applications that run on an operating sytem

1   to ensure compatibility with the new operating system and in many cases
2   requires application upgrades (if available) to ensure applications run well with
3   the new operating system, if not to ensure outright compatibility. This required
4   coordination with our vendors and across platforms and software to ensure our
5   systems would function as intended when we moved to Windows 10.   In
6   addition, upgrading to Windows 10 required that we refresh our network
7   infrastructure.

8

9   Q.   WHAT WERE THE BUSINESS SYSTEMS ACTUAL CAPITAL ADDITIONS FOR THE
10   YEARS 2018-2020?
11   A.   The 2018-2020 capital investments that the Company made are provided below
12   in Table 1 and Figure 1.

13

Table 1

2018-2020 Actual Capital Additions

(Dollars in Millions)

Capital Category	2018	2019	2020
Aging Technology	$50.7	$66.3	$52.4
Cyber Security	6.4	4.5	11.6
Enhance Capabilities	19.2	32.9	5.3
Customer	-	-	17.2
AGIS	-	11.7	4.7
NSPM Total	**$76.4**	**$115.3**	**$91.2**

*There may be differences between the sum of the individual category amounts and Total
amounts due to rounding.

Figure 1

2018-2020 NSPM Capital Additions

■	Aging Technology
■	AGIS - Business Systems
■	Customer
■	Cyber Security
■	Enhance Capabilities
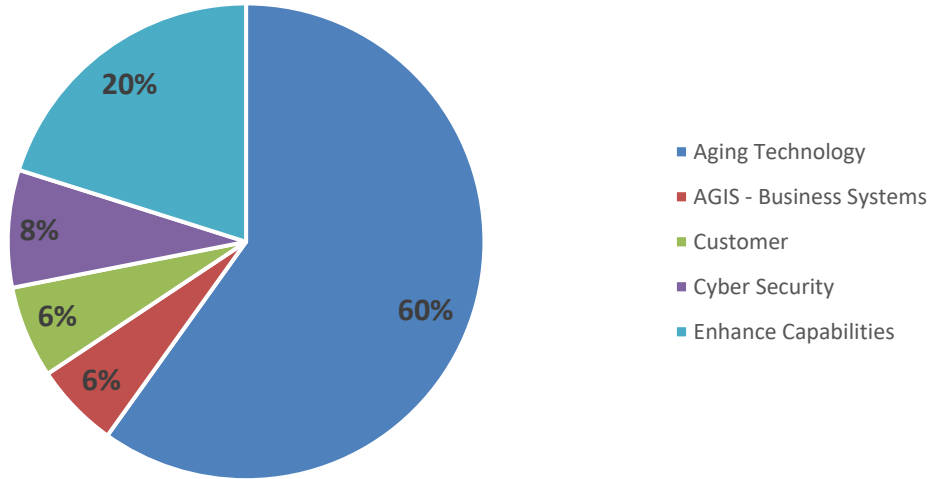
Q. CAN YOU EXPLAIN WHY THE AMOUNTS OF INVESTMENT IN THESE CAPITAL BUDGET GROUPINGS VARIED OVER THESE THREE YEARS?

A. Yes. Our investments vary year over year depending on the needs of existing technology systems. In 2018, capital additions were significantly lower than in the immediate prior years. In the prior years, one of the most significant recent undertakings in the Business Systems area was the development of the new General Ledger (GL) and Work and Asset Management (WAM) system as part of our Productivity Through Technology (PTT) initiative, which was its own budget grouping at the time, highlighting the significance of that initiative. The majority of the investments in the GL were undertaken in 2014 through 2015, with some preliminary work in 2013 and some post-implementation follow-up in early 2016. The GL was placed in service at the end of 2015. Most of the WAM implementation work was completed and placed in service by the end of 2017.

1   In 2019, there were several large project additions that drove up investment in
2   aging technology and enhancing capabilities, including the Land Mobile Radio
3   (LMR) project $14.4 million, the Microsoft Next Generation project $8.0
4   million (continued from 2018), and the Enterprise Service Bus (ESB) $7.5
5   million. Additionally, our AGIS initiative got underway in 2019, focusing on
6   implementation of the Advanced Distribution Management System (ADMS)
7   and associated components of the Field Area Network (FAN), as well as
8   support for the Time of Use advanced meter pilot. I note that these costs are
9   now approved for inclusion in the Transmission Cost Recovery (TCR) Rider
10   through separate filings and are therefore not included in this rate case, except
11   for certain internal labor costs as discussed below.

12

13   In 2020, while we continued work to refresh our aging technologies, upgrade
14   our cyber security capabilities, and enhance the Company's capabilities, we also
15   began significant investments in the customer experience area, which got
16   underway in 2019. In Section III.B., I describe in more detail the work we have
17   completed so far in this program and the work we look forward to
18   implementing during the MYRP.

19

20 Q. DO YOU HAVE ANY OTHER COMMENTS RELATED TO THIS CAPITAL INVESTMENT
21   HISTORY FOR 2018-2020?

22 A. Yes, I have a few comments related to how these numbers might compare to
23   future budgeted amounts. First, as we continue to turn to initiatives including
24   the customer and distribution grid focus mentioned earlier, we will continue to
25   see a portion of our resources dedicated to those areas (the customer experience
26   and AGIS) over the next few years. Additionally, as I will discuss later,
27   Emergent Demand dollars are ultimately invested to support other categories'

1 capital projects, and therefore appear as capital additions under those categories

2 (rather than in Emergent Demand) for prior years. Finally, I will discuss below

3 how the Company is investing in enhancing capabilities in order to better serve

4 our customers and mitigate increases in O&M expenses.

5

6 Q. LOOKING AT THIS HISTORY, WHAT DO YOU CONCLUDE?

7 A. Business Systems' prior capital investments have supported the technologies

8   needed to provide electric service to our customers. Without ongoing

9   investment in technologies, we would lack the tools to operate reliably and

10   securely, support functional decision-making, enable communications and

11   "smart" resources, and protect such fundamentally important resources as our

12   grid, our customer information, our generation management, and our financial

13   data.

14

15 Q. MOVING FORWARD, CAN YOU ADDRESS BUSINESS SYSTEMS' CAPITAL WORK IN

16   2021 SO FAR?

17 A. Yes. We have continued to invest in routine replacements as well as projects to

18   address outstanding business needs, with a focus on customer experience.

19   Customer experience investments will continue to be a focus for the next

20   several years, as changing customer expectations are requiring us to work to

21   continuously improve and maximize the performance of the tools serving

22   customers, albeit with declining implementations during the MYRP as the major

23   foundational investments are implemented in 2021 into 2022, with certain

24   continued specific implementations with defined outcomes to build out

25   transformational customer experiences. Finally, we are continuing work on our

26   AGIS initiative.

1   Q.   ARE THERE ANY NOTABLE INDIVIDUAL BUSINESS SYSTEMS PROJECTS
2   OCCURRING IN 2021?
3   A.   Other major investments in 2021 include Annual Refreshes, Digital Operations
4   Factory – Nuclear Lighthouse and Digital Operations Factory enabling
5   capabilities. The Digital Operations Factory is a cloud-based, modern data and
6   analytics platform that will enable the Company to make better use of available
7   data to enhance both customer journeys and core operational processes. This
8   project will deliver a secure multi-tenant cloud platform as a foundational
9   engine for each of the following capabilities: reusable data lake; common
10   integrations; analytics workbench; mobile platforms; dashboard framework, and
11   artificial intelligence models. Once the foundation is built the project examples
12   include predictive modeling, real time scheduling systems, operations work
13   management, routing and screen of data, work dashboards, and profiles.

14

15   Q.   HAS THE COVID-19 PANDEMIC AFFECTED BUSINESS SYSTEMS CAPITAL
16   INVESTMENTS IN 2020 AND BEYOND?
17   A.   COVID-19 has impacted Business Systems' priorities by requiring us to prepare
18   staff to work remotely, necessitating increased network support and new work-
19   at-home tools, and by thinking differently for projects that require in-person
20   testing. In some cases, as with other business changes, this has required us to
21   implement projects differently and/or has resulted in some minor delays. Of
22   course, traveling was also reduced due to new Company restrictions. The
23   Business Systems area has updated our financial budgets for 2021 and beyond
24   to reflect our best estimate of these financial impacts, and will continue to adjust
25   as more COVID-19 information is available. This is consistent with the
26   approach we would take related to any of the various ways our business may
27   evolve during a given period.

1   *2.   Overview of the 2022-2024 MYRP*

2   Q. WHAT ARE YOUR CAPITAL ADDITION FORECASTS FOR 2022-2024 BY CAPITAL

3   BUDGET GROUPING?

4   A. Our capital addition forecasts by budget grouping for 2022 through 2024 are

5   set forth in Table 2 and Figure 2, below. Individual project capital investment

6   additions are also listed in Exhibit___(MOR-1), Schedule 2.[2]

7

8   **Table 2**

9   **2022-2024 Actual Capital Additions**

10   **(Dollars in Millions)**

11

Categories	2022	2023	2024
Aging Technology	$64.9	$121.2	$42.6
Cyber Security	17.3	13.2	15.6
Enhance Capabilities	28.3	56.0	17.9
Customer	7.9	1.2	.4
Emergent Demand	(2.8)	4.4	12.8
AGIS	10.5	16.3	7.8
NSPM Total	**$126.1**	**$212.3**	**$97.1**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

---

[2] In some cases, rounding may result in a slight variation between some tables and Exhibit___(MOR-1), Schedule 2.

Figure 2

2022-2024 NSPM Capital Additions

Legend
■ Aging Technology
■ Cyber Security
■ Enhance Capabilities
■ Customer
■ Emergent Demand
■ AGIS
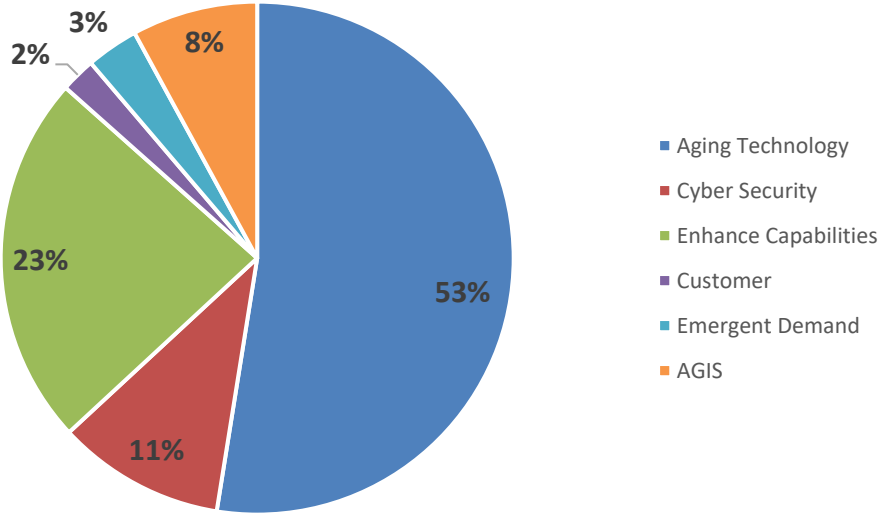
Q. WHAT KEY PROJECT AREAS WILL THE COMPANY INVEST IN DURING THE 2022-2024 TIME PERIOD?

A. As illustrated by Table 2 and Figure 2 above, Business Systems is devoting significant resources to address aging technology, enhancing capabilities, and cyber security initiatives. We are also continuing to manage for emerging needs.

Our aging network infrastructure continues to be a key driver of increased investment and requires attention on an ongoing basis, which as I previously indicated is a critical operational foundation required for the Company to provide a safe and reliable product. In addition, we continue to seek out areas that will enhance the Company's capabilities to provide value to our customers. An example of this, and a primary driver of the increase in 2023 as compared to 2022 and 2024, is the Strategic Fiber Deployment, which will allow for

1   substantial network growth for Xcel Energy. I will discuss these efforts in more

2   detail later in my testimony.

3

4 Q. CAN YOU PROVIDE AN OVERALL PICTURE OF YOUR CAPITAL EXPENDITURES

5   AND CAPITAL ADDITIONS TRENDS FROM 2018 THROUGH THE END OF THE

6   MYRP (2024)?

7 A. Yes. Our overall 2018 through 2024 capital additions and capital expenditures

8   are set forth in Tables 3 and 4 below. I have broken these numbers out by

9   general Business Systems (included in this case) and AGIS additions and

10   expenditures, which as noted above will be recovered via the TCR Rider.

11

12 **Table 3**

13 **2018-2024 Actual Capital Additons**

14 **(Dollars in Millions)**

15

	2018 Actual	2019 Actual	2020 Actual	2021 Actual/ Forecast	2022 Forecast	2023 Forecast	2024 Forecast
Aging Technology	$50.7	$66.3	$52.4	$86.5	$64.9	$121.2	$42.6
Cyber Security	6.4	4.5	11.6	15.9	17.3	13.2	15.6
Enhance Capabilities	19.2	32.9	5.3	61.2	28.3	56.0	17.9
Customer	-	-	17.2	40.7	7.9	1.2	.4
Emergent Demand	-	-	-	(4.3)	(2.8)	4.4	12.8
AGIS	-	11.7	4.7	48.2	10.5	16.3	7.8
NSPM Total	**$76.4**	**$115.3**	**$91.2**	**$248.4**	**$126.1**	**$212.3**	**$97.1**

23 *There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Table 4

2018-2024 Actual Capital Expenditures

(Dollars in Millions)

	2018 Actual	2019 Actual	2020 Actual	2021 Actual/ Forecast	2022 Forecast	2023 Forecast	2024 Forecast
Aging Technology	$47.0	$52.4	$69.1	$71.8	$80.3	$80.4	$42.3
Cyber Security	5.1	8.3	9.7	15.2	15.4	17.1	17.0
Enhance Capabilities	25.3	22.5	20.5	55.3	46.0	25.6	15.0
Customer	-	9.7	20.1	26.5	6.4	1.2	.4
Emergent Demand**	-	-	-	(13.8)	9.4	6.5	15.1
AGIS	10.9	13.3	16.1	8.7	6.0	8.2	8.4
NSPM Total	**$88.3**	**$106.2**	**$135.5**	**$163.6**	**$163.5**	**$139.1**	**$98.2**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.
**Emergent Demand includes budgeted dollars in each year, which are then utilized for projects in other Business Systems categories. As such, Emergend Demand funds are reallocated to other business categories in actual results.

Tables 3 and 4 illustrate that Company investments in IT vary depending on the specific work that is necessary for our business and our customers in a specific year. In the years when less investment is needed, we budget accordingly, and Company resources are used where they may be required in other business areas. Conversely, Business Systems capital expenditure levels necessarily increase in years when we are embarking on significant initiatives, and capital additions necessarily increase when those initiatives are placed in service.

1   Q.   WHY DO CAPITAL ADDITIONS TOTALS DIFFER FROM CAPITAL EXPENDITURE

2   TOTALS?

3   A.   While the capital addition trend is directly affected by our capital expenditures,

4   the capital additions (plant in service) trend may not mirror the capital

5   expenditure (spend) trend and may fluctuate more depending on the length of

6   time individual projects require to complete. The capital expenditure trend

7   reflects the progress of the project through the months, whereas the capital

8   addition trend reflects the total at the conclusion of the construction or

9   implementation process when the asset is placed in service. Company witness

10   Mr. Mark Moeller addresses how the Company's overall capital additions align

11   with budgeted capital additions in any given year. I address the specific capital

12   additions driving Business Systems costs below.

13

14   *3.   Major Capital Projects*

15   Q.   WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

16   A.   This section of my testimony introduces the major capital projects Business

17   Systems anticipates for the MYRP period 2022 through 2024 that I will describe

18   in more detail in Section III.D-F of my Direct Testimony. It is my

19   understanding that general descriptions of these major capital projects for 2022

20   through 2024 is also required by the multi-year rate plan statute, Minn. Stat. §

21   216B.16, subd. 19.

22

23   Q.   WHAT MAJOR CAPITAL PROJECTS DOES BUSINESS SYSTEMS ANTICIPATE

24   COMPLETING OVER THE PERIOD OF THE COMPANY'S MYRP REQUEST?

25   A.   As shown Table 5 below, we anticipate undertaking five major capital projects

26   from 2022 through 2024. These capital additions include:

Table 5

2022-2024 Major Capital Projects

(Dollars in Millions)

Project	2022	2023	2024
Annual Refresh	$14.8	$14.2	$16.1
Technology License	2.6	25.2	2.6
DEMS Upgrade AKA Dynamic EMS (DEMS) Environment Phase 4	-	27.6	-
Strategic Fiber Deployment	-	23.3	-
Infrastructure Modernization	6.3	6.5	7.5
NSPM Total	**$23.7**	**$96.8**	**$26.2**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Some of these projects, including our technology licensing work, will continue over multiple years, with portions of the projects placed in service as they are put to use each year. The major capital projects and key additional projects we expect to complete during the MYRP are discussed in more detail under each plan year below.

Q. ARE THERE OTHER MAJOR CAPITAL PROJECTS NOT INCLUDED IN BASE RATES?

A. Yes. As illustrated in Tables 3 and 4, our investments in the AGIS initiative comprise a substantial portion of Business Systems' budget for the MYRP period and require significant business area resources. However, most of these costs are certified for recovery in the Company's Transmission Cost Recovery Rider and are not included in base rates, as discussed in more detail by Company witness Mr. Benjamin Halama and later in my Direct Testimony.

1   *4.   Challenges Facing the IT Business Area*

2   Q.   ARE THERE CHALLENGES UNIQUE TO BUSINESS SYSTEMS THAT CAN AFFECT THE

3   COMPANY'S BUDGETING AND ACTUAL EXPENDITURES?

4   A.   Yes. Technology changes constantly. As a result, issues with older software or

5   equipment may not seem critical during budget creation but become critical if

6   systems begin to show signs of issues or failure, or no longer serve their

7   intended purpose. Additionally, cyber security threats are constantly in flux and

8   may result in additional investment in a given year to ensure that cyber security

9   tools and resources are responsive to new threats to our information systems.

10   As IT has become increasingly critical to the business, the demand for IT

11   solutions and fixes far outpaces the dollars available to meet those requests. As

12   a result, it is necessary to constantly monitor, and sometimes re-prioritize, the

13   percent of total dollars invested in each capital budget grouping.

14

15   Q.   WILL BUSINESS SYSTEMS STILL MANAGE ITS OVERALL CAPITAL INVESTMENTS TO

16   ITS OVERALL BUDGET?

17   A.   Yes, it will. Our overall budget supports our investments in technologies and

18   supporting services as necessary to ensure system reliability and security, to

19   facilitate operational decision-making, and to provide the necessary levels of

20   support to our customer support and business capability functions. Business

21   Systems is expected to manage its capital additions to its capital budget once

22   that budget has been developed, fully-vetted, and approved, as I discuss in

23   Section III.C.

24

25   Q.   ARE THERE ANY OTHER BUSINESS TRENDS THAT YOU WOULD LIKE TO DISCUSS?

26   A.   Yes, just briefly. As the technology landscape continues to evolve, cloud

27   computing is becoming a more common way for companies to provide IT

1 services. This presents unique decision-making requirements as we look to

2 future IT solutions, and can also present financial challenges because some

3 cloud solutions might be treated as O&M whereas the same solution would be

4 capitalized when owned by the Company.

5

6 Q. WHAT ARE THE POTENTIAL BENEFITS OF CLOUD COMPUTING?

7 A. In some cases, there may be cost benefits associated with transitioning to cloud

8 computing because third-party service providers can offer pricing that is

9 leveraged across many customers since costs of operating and maintaining

10 servers would be shared among many parties utilizing cloud services.

11 Additionally, cloud computing benefits may also include having the most up-

12 to-date technology available, allowing for more seamless, regular upgrades that

13 are less disruptive to business operations, affording more scalability and

14 flexibility as Company needs change to meet Company and customer needs,

15 and could bring increased security.

16

17 Q. HOW WILL THE COMPANY MAKE THE TRANSITION TO INCREASE UTILIZATION

18 OF CLOUD COMPUTING?

19 A. The Company will need to continue to create a decision framework to identify

20 when leveraging cloud technology may improve business objectives,

21 productivity, and the customer experience.

22

23 Q. WHAT IS THE FINANCIAL TREATMENT OF HOSTED SOLUTIONS?

24 A. When capital policy requirements are met, the Company will capitalize a hosted

25 solution in a similar way as an on-premises solution. In other scenarios, the on-

26 pemises storage is capital because the Company effectively takes ownership of

27 the hardware and/or code, while others are O&M when they do not meet the

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1   Company's capitalization requirements. The general terms of the Company's

2   capitalization policy are discussed by Mr. Moeller in his Direct Testimony.

3

4 Q. WHAT DO YOU CONCLUDE ABOUT BUSINESS SYSTEMS' 2022-2024 CAPITAL

5   INVESTMENT FORECASTS?

6 A. I conclude that our capital forecasts represent an accurate, reasonable, and

7   representative picture of our IT investments over these years. History

8   demonstrates that the Company will make the investments necessary to serve

9   customers safely and reliably. Therefore, these forecasts can be relied on to set

10   just and reasonable rates for our customers.

11

12   **B.**   **Business Systems Investment Needs**

13 Q. WHAT ISSUES ARE DRIVING BUSINESS SYSTEMS' STRATEGIC CAPITAL PLANNING?

14 A. As I discussed above, the five key areas driving IT investment going forward

15   are: (1) replacing aging technology; (2) addressing evolving cyber security threats

16   and requirements; (3) enhancing capabilities; (4) enhancing the customer

17   experience; and (5) addressing emergent demands. I discuss each of these areas

18   below. I also discuss our investment in the AGIS initiative, although these costs

19   (except for certain internal labor costs, as addressed by Company witness Mr.

20   Benjamin Halama) are not proposed for recovery in this rate case because we

21   anticipate seeking cost recovery in the TCR Rider. I will also explain how we

22   are addressing emergent demands in the next section, Project Budgeting and

23   Governance.

1   *1.   Aging Technology*

2   Q.   WHAT ARE THE PRIMARY ISSUES FACING THE COMPANY WITH REGARD TO

3   AGING TECHNOLOGY?

4   A.   Business Systems supports the operations of the Company with a large and

5   growing IT infrastructure. Information assets are no different from physical

6   assets, although IT assets have generally shorter lives. They are subject to aging,

7   technological obsolescence, and increasing maintenance costs. Business

8   Systems not only completes routine annual refreshes of technology, like

9   replacing computers and printers, but also plans and places in service large IT

10   projects that modernize the Company's IT and address the needs and

11   experiences of our customers and employees. A reasonably up-to-date

12   infrastructure is necessary for the Company to continue to meet increasingly

13   demanding data security, reliability, and compliance requirements, as well as the

14   service expectations of our customers. For example, some aging technologies

15   are not equipped with the most current data security measures, meaning they

16   are more vulnerable to cyber attack. In addition, the recovery of aging

17   technologies after an outage can be compromised if those systems are no longer

18   supported by their vendor.

19

20   Replacing or upgrading aging IT also affords the Company the opportunity to

21   take advantage of certain enhancements or efficiencies of more modern IT,

22   such as automating previously labor-intensive processes in order to reduce labor

23   costs and other employee expenses, such as travel time. Other upgrades make

24   our systems more secure, make them more consistent with existing IT across

25   the Company, or are implemented to maintain compliance with regulations.

1   Another area of IT that must keep pace with current needs is our Company's

2   data storage capabilities.   The increasing use of technology across the

3   organization is resulting in the need to store, transmit, and manage ever larger

4   amounts of data, and our systems must be able to keep up with these growing

5   data storage needs. While solutions such as routine information purging and

6   data warehousing can help reduce the impact of this data "explosion," they are

7   not sufficient to fully mitigate it. As a result, we need to increase our storage

8   capacities and the speed and flexibility of our networks, and improve our tools

9   to cost effectively manage our data and information.

10

11   Q.   HOW DOES THE COMPANY DETERMINE WHEN EXISTING IT NEEDS TO BE

12   REPLACED?

13   A.   Business Systems strives to maximize our technology investments by

14   maintaining existing software and hardware until the risk and costs associated

15   with keeping these aging technologies in place require attention. For instance,

16   new software systems are often necessary when the existing software is no

17   longer supported by the vendor.

18

19   A recent example is the Company's DEMS Upgrade. This plan leverages a long-

20   term solution to keep our transmission system supported and secure, over

21   multiple phases, to maximize value and minimize customer cost over time. The

22   first DEMS project was presented in our 2016 NSPM rate case. At that time,

23   we did a complete replacement for the NSP Energy Management System

24   (Dynamic EMS - DEMS) with the General Electric (GE) product that went live

25   in May of 2016 for NSP. The project included completely new hardware,

26   network, and software environment(s). This project started at the end of 2012

27   to allow appropriate time for implementation because EMS replacements are

1   complex and there is no margin for error; they need to be 100 percent functional
2   when placed into production.

3

4   The current DEMS project in the upcoming MYRP is driven by a contractual
5   agreement to upgrade DEMS to a newer version within six years of the executed
6   contract, given the pace at which the technology advances. The new hardware
7   and network components with the upgrade project will enhance our cyber
8   security posture and enable greater segmentation for this critical system. The
9   new operating and application software will also help with security since they
10   will remain in support by the vendors. But by completing the work in phases
11   and not upgrading to subsequent operating systems and infrastructure until
12   necessary, the Company is maximizing its initial investment and value to
13   customers.

14

15   *2.   Cyber Security*
16   Q. PLEASE SUMMARIZE THE CYBER SECURITY ISSUES FACING THE COMPANY.
17   A. There are four key cyber security issues the Company must address: (1) keeping
18   hackers out of our systems; (2) detecting hackers if they attempt to gain access
19   to our systems; (3) removing hackers that gain access to our systems; and (4)
20   returning our systems to their original state if hackers gain access. As the
21   number of cyber threats, attacks, and regulatory requirements continues to
22   increase in volume and complexity, it is imperative that the Company establish
23   and maintain the proper tools to protect the integrity and confidentiality of our
24   data and our systems. Given the unpredictability of these threats, it is important
25   that these tools and resources continue to change in response to new threats to
26   our information systems.

1   It is important to note that cyber security is not simply a matter of implementing

2   a standardized base of security controls and processes that cover all the

3   regulatory and legal requirements. Effective cyber security also requires filling

4   the security gaps that would exist if we focused solely on regulatory and legal

5   compliance. Many large financial companies that have had their data hacked in

6   recent years were compliant with regulatory and legal requirements.

7

8   Q.   WHAT IS BUSINESS SYSTEMS DOING TO ADDRESS THOSE CYBER SECURITY

9   ISSUES?

10   A.   The Company has taken great strides to address cyber security issues. This

11   includes creation of a dedicated Enterprise Security and Emergency

12   Management (ESEM) business area. The purpose of the ESEM is to enable the

13   Company's vision, mission, and goals by proactively leading efforts to identify,

14   protect, detect, and respond to all-hazard threats and events. The ESEM

15   oversees all aspects of security, which includes: cyber, physical, and personnel;

16   investigations and digital forensics; threat management; privacy (customer and

17   employee); enterprise emergency management; and the enterprise North

18   American Electric Reliability Corporation Critical Infrastructure Protection

19   (NERC CIP) program. There are multiple ways that the ESEM addresses new

20   threats and solutions to cyber security issues.

21

22   First, ESEM exists to manage our overall cyber security posture, implement

23   processes and plans to be able to quickly mitigate any adverse events, respond

24   appropriately and effectively to large scale events that would otherwise cause

25   significant harm to the bulk electric system and/or natural gas

26   delivery systems, and ensure regulatory compliance.

1   Second, to meet the needs and demands of today's security requirements,
2   Business Systems has implemented multiple security systems and technologies.
3   We have implemented technologies to date that include: Vulnerability
4   Management; Advanced Threat Protection; Security Forensic tools' Advanced
5   Firewalls' Intrusion Prevention Devices; and a Security Incident and Event
6   Management system to correlate all the data and bring visibility to what is
7   happening on our infrastructure.
8
9   Third, we have enhanced our partnerships with both regulatory and state and
10   federal agencies to ensure we are tapped into the stream of information available
11   regarding impending threats and attacks. These associations and agencies
12   include Edison Electric Institute, National Infrastructure Advisory Council,
13   American Gas Association, the Federal Bureau of Investigation, and the U.S.
14   Department of Homeland Security.
15
16   Finally, our disaster recovery team works with application support teams to
17   validate their disaster recovery plans on an annual basis. We have also
18   implemented an isolated infrastructure and computing platform to enable
19   thorough physical testing of recovery plans for certain critical applications, such
20   as those running on the SAP platform, to ensure full recoverability.
21
22   *3.   Enhancing Capabilities*
23   Q.   HOW DOES BUSINESS SYSTEMS ASSIST IN ENHANCING CAPABILITIES FOR THE
24   COMPANY?
25   A.   Technology can offer the opportunity to improve productivity, enhance
26   communications between systems and between people, and use data more
27   efficiently. As an example, mobile phones were not necessarily invented to

1   solve a problem with land-based telephone lines or service. However, as they

2   emerged and became increasingly sophisticated, they have changed our society.

3   We have needed to adapt and learn how to derive as much efficiency as possible

4   from what have become wireless mobile computing devices. Business Systems

5   must constantly evaluate new technologies to help the business areas increase

6   efficiencies and enhance communications between systems that benefit the

7   Company and our customers.

8

9   Q.   HOW DOES BUSINESS SYSTEMS DETERMINE WHICH CAPABILITY-ENHANCING

10   TECHNOLOGIES TO IMPLEMENT?

11 A.   The key is to identify new technologies and to implement only those

12   technologies that can offer efficiency benefits that outweigh their

13   implementation costs. Business Systems works prudently with various business

14   units to evaluate new technologies to determine whether they can be used to

15   improve efficiency in the way tasks are completed, data is used, or in the way

16   communications are conducted within the organization and with external

17   stakeholders, including our customers. For example, adding land mobile radios

18   at our nuclear facilities and, going forward, within the Twin Cities metropolitan

19   area, enhances our ability to conduct secure communications between work

20   crews across highly sensitive locations.

21

22 Q.   HOW DO YOU DIFFERENTIATE BETWEEN ENHANCE CAPABILITIES

23   INVESTMENTS AND THE AGING TECHNOLOGY INVESTMENTS?

24 A.   Due to the nature of certain IT investments, some investments overlap between

25   categories. That said, the projects in the Aging Technology category typically

26   involve the replacement of assets that were already in service, while the projects

27   in the Enhance Capabilities category typically involve implementing systems

1   that are new applications or application modules that add to business capability

2   or efficiency. When applications are upgraded, business judgment is necessary

3   to determine which categorization is most appropriate.

4

5   *4.   Customer Experience*

6   Q.   WHAT IS XCEL ENERGY REFERRING TO WHEN IT DISCUSSES A "CUSTOMER

7   EXPERIENCE"?

8   A.   The customer experience refers to the Xcel Energy customer's direct

9   interactions with the Company, whether by digital platforms, through the call

10   center, in person, or otherwise. To manage that experience, we must have in

11   place both system tools and customer interfaces that work for the customer,

12   supporting their satisfaction with our service and their overall experience with

13   our company.

14

15   Q.   PLEASE DESCRIBE EFFORTS BY THE COMPANY TO ENHANCE THE CUSTOMER

16   EXPERIENCE.

17   A.   Over the last few years we have needed to focus on updating our primary

18   customer touch points and relationship management tools. In support of the

19   enterprise focus on enhancing customer experience, we launched a new

20   Customer Experience Transformation (CXT) program in April 2019 to help

21   create smarter and simpler experiences for our employees and customers. This

22   multi-year effort is designed to simplify our technology, transform customer

23   experiences, improve customer satisfaction and employee engagement, and

24   continue to drive more efficient operations. Since launch, the CXT program

25   has been the primary driver and focus of customer experience capital additions.

1   In order to better describe these capital implementations given their significance
2   to Business Systems work, the Company has described these additions in a
3   separate, customer experience category, apart from aging technologies,
4   enhancing capabilities, and cyber security work. Implementation of the
5   foundational investments of the CXT program will primarily be completed by
6   the end of 2021; however, we continue to implement individual components
7   with defined outcomes that will build out the CXT program and create new
8   experiences for our customers. Thus, the Company will continue to build on
9   foundational investments with individual components that will drive specific
10   customer experiences, whether it is interactions with the Company's website,
11   MyAccount, our mobile applications, or other areas. Our work in developing
12   and implementing the CXT program continues to drive how we think about
13   enhancing the customer experience; therefore, I describe this effort in more
14   detail in this section of my Direct Testimony.

15

16   Q.   OVERALL, WHAT IS THE CXT PROGRAM?
17   A.   CXT is a program developed to work strategically on enhancing our digital
18   channels, developing a data fabric model and migrating our customer and
19   business data into the model, and designing, building, testing, and deploying the
20   foundational components to allow the first two to operate. More specifically,
21   we are utilizing more modern technologies that our customers have come to
22   expect through experiences with other companies. This includes interactive
23   websites, account management options, and smart phone applications.

24

25   As we utilize more modern technologies for our customers, we will
26   simultaneously need to invest in new capabilities like data science, user design,

1   and development. We are also utilizing our employees' innovative thinking to

2   align with our customers' needs and expectations.

3

4   Q.   WHY IS IT WORTHWHILE TO INVEST IN MEETING THESE NEEDS NOW?

5   A.   In today's evolving technology market, utility customers' expectations are not

6   set exclusively by utility companies; rather, high expectations are being set by

7   companies like Google, Apple, and Amazon, who show customers what is

8   possible and lead them to expect responsive, integrated, and problem-solving

9   interactions with their service providers. Living in an era where customer's

10   expectations are higher than they have ever been, the Company must be

11   prepared to meet our customer's needs to remain a trusted provider of their

12   energy services.

13

14   Q.   WERE THERE BARRIERS TO MEETING THESE CUSTOMER NEEDS AND

15   EXPECTATIONS UNDER THE COMPANY'S PREVIOUS CUSTOMER-FACING

16   PLATFORMS?

17   A.   Yes. Prior to implementing the CXT program components, our systems were

18   not designed to be a customer relationship management system. Our legacy

19   systems handled a significant volume of transactions on a daily basis and, over

20   time, the amount of data that they store and manage builds and increases. The

21   number of systems that they had to interact with had grown as well, as illustrated

22   in the left-hand side of Figure 3 below (visually demonstrating the previous state

23   to current/future state). As a result, those interconnected systems had to work

24   harder in order to stay reliable and responsive. As those systems were

25   implemented and their connections built along the way, the integration and data

26   technologies required to efficiently build out a more layered architecture in a

1   cost-effective manner were not available, which created risk of system failure

2   that could impact billing and payment operations, for instance.

3

4   An improved architecture as a result of CXT, shown on the right side of Figure

5   3, allows us to offload the pressure that has been placed on those applications

6   and the information they contain. The architecture allows us to organize and

7   centralize relevant data so that it can be used in multiple ways without directly

8   impacting them. In doing so, we simplify access to information and will be

9   prepared to efficiently support increasing customer, business, and security

10   demands.

11

12   **Figure 3**

13

19

20   Q.   HOW DID XCEL ENERGY IDENTIFY THE NEED FOR IMPROVEMENTS IN THE

21   COMPANY'S DIGITAL INTERACTIONS WITH CUSTOMERS.

22   A.   Across Xcel Energy, we continuously capture customer feedback regarding

23   their interactions with us to understand if we are meeting their needs and where

24   we should focus to improve the customer experience. In 2016, we implemented

25   a new customer experience measurement practice that is centered on capturing

26   customer satisfaction on key customer service channels including our contact

27   center, website and our mobile app.

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1   One of the key takeaways is that customers expect a seamless and simple

2   interaction and that our digital platforms (such as our website, MyAccount,

3   mobile app, and Customer Connection) are falling short of expectations.

4   Customer satisfaction is low and/or has declined at the same time customer

5   satisfaction with non-digital forms of interaction (contact center agents, IVR,

6   and email correspondence) remains very high. We particularly noted declining

7   satisfaction with respect to our billing and payment platforms, as well as new

8   customer digital interactions and outage response digital communications. A

9   September 2019 report on this data is attached to my Direct Testimony as

10   Exhibit___(MOR-1), Schedule 4.

11

12   Q.   WHAT AREAS RELATED TO UTILITY SERVICE ROSE TO THE TOP OF THIS

13   ANALYSIS?

14   A.   We identified that we could improve the customer experience in a timely

15   manner, with high value to customers and reasonable complexity and cost levels

16   by focusing on the following three areas: (1) Customer Assistance (Get Help)

17   platforms, including making it easier for customers to find information on their

18   services, usage, billing and payment, as well as the ability to have multiple

19   channels to address their needs, such as MyAccount, the Company website

20   (xcelenergy.com), and Xcel Energy mobile applications; (2) Service Initiation

21   (Start Service), which relates to starting electric or gas service; and (3) Electric

22   vehicle (EV) support. CXT primarily relates to (1) and (2).

23

24   Q.   HOW WILL BUSINESS SYSTEMS SUPPORT EV ADOPTION ACROSS MINNESOTA?

25   A.   As Company witness Ms. Kelly A. Bloch identifies in her Direct Testimony, the

26   Company has implemented multiple EV programs over the past few years with

27   the support of the Commission. Specifically, Ms. Bloch provides an overview

1   of our Commission-approved EV programs and how the Company is

2   supporting EV adoption in Minnesota. Business Systems will play a critical role

3   in supporting our EV programs by focusing on the customer connection and

4   customer service platforms on the IT side. However, at this time, all budgeted

5   expenditures for EV support are included in Ms. Bloch's Direct Testimony.

6

7 Q. WHAT WORK DID THE COMPANY ULTIMATELY DETERMINE IS NECESSARY TO

8   IMPROVE THE CUSTOMER EXPERIENCE IN TODAY'S UTILITY LANDSCAPE?

9 A. The initial CXT program is, ultimately, a series of foundational investments in

10   platform infrastructure and data analytics and automation that are intended to

11   improve the Company's digital interfaces with customers. Recognizing that

12   additional work will likely be needed and that customers will need to acclimate

13   to changed interfaces with the Company, initial work and investments to

14   improve the customer experience were divided into certain project areas: (1)

15   Digital Channel Platforms (including MyAccount, the Company's website, Xcel

16   Energy mobile applications, and new customers and real estate developers'

17   initial connections with the Company (Customer Connect); (2) the Customer

18   Relationship Management (CRM) Platform (currently Salesforce); (3) Platform

19   Infrastructure and Technology Maintenance; and (4) Data Analytics and

20   Automation. Most of this foundational work will be completed by 2021, but

21   CXT program work will continue, with additional components being placed in

22   service in the future to build on the foundational work and continue to enhance

23   customer experiences.

24

25 Q. WHAT PROGRESS HAS THE COMPANY MADE ON THIS INITIATIVE TO DATE?

26 A. We approached this program in phases, with initial deployments occurring in

27   2020 and continuing throughout 2021 into 2022. Xcel Energy has now

1	deployed the technology foundation in which new experiences are being built
2	upon, including services like new customer connections and our service
3	channels. Additionally, a new experience has been launched for Building and
4	Remodeling customers, which streamlines the builder's interaction with Xcel
5	Energy when requesting service to a new home or development.
6	
7	Specifically, through 2021 we have achieved the following:
8	• Designed, built, tested and deployed the cloud-based infrastructure for
9	our web-based applications and data grid;
10	• Designed, built, tested, and deployed our data grid infrastructure and
11	began the migration of data;
12	• Began the implementation of our Salesforce infrastructure;
13	• Designed, built, tested, deployed our new customer connection
14	application;
15	• Built a series of integration points between our legacy applications and
16	our new environment;
17	• Built a set of automaton testing tools to expedite our deployment of
18	future applications in this space;
19	• Updated our content on our FAQ pages;
20	• Built out, enhanced, and redesigned several components of our
21	customers' digital interactions with the Company, and has included
22	enhancing and modernizing Xcel Energy's customer-facing online digital
23	platforms and underlying technologies, MyAccount, our mobile
24	application, and website, www.xcelenergy.com;
25	• Built out our Contact Center capabilities with IVR technology;

1   • Built out outages and notifications experiences to provide more accurate

2   and timely outage information and restoration information and to

3   provide new capabilities within the CRM platform; and

4   • Built out the existing CRM platform (Salesforce) to better serve our

5   customers with a redesigned platform with new modules, including new

6   Customer Identity and Access Management (CIAM) work, which enables

7   single sign-in customer access and identity management to support

8   MyAccount and Mobile App login (and other products).

9

10 Q. LOOKING FORWARD, WHAT CONTINUES TO BE THE FOCUS OF THE CUSTOMER

11   EXPERIENCE?

12 A. Certain foundational work continues, and I explain below our "single screen"

13   work that will help our employees more productively and efficiently assist our

14   customers. In addition, we look to upgrade our CRS application overall and

15   with certain components as part of the CRS Tech Stack, which is included

16   among our smaller projects. Significantly, over the term of the MYRP, we look

17   to develop program interfaces that will relieve pressure on our core systems

18   with new data layers and capabilities, which will afford more flexibility and

19   capacity for our core systems, as part of a multi-year initiative.

20

21   *5. AGIS*

22 Q. HOW IS BUSINESS SYSTEMS ASSISTING IN MODERNIZING THE DISTRIBUTION

23   GRID?

24 A. Business Systems plays a key role in developing the IT systems and systems

25   integration that are necessary to develop a more advanced distribution grid. We

26   work hand-in-hand with Distribution and Customer Care to develop a plan that

27   will bring our distribution grid into the future, making it more responsive,

1   interactive, supportive of distributed energy resources, and informative to

2   customers. We will also be utilizing data and information from the AGIS

3   initiative to enhance our customer experience program.

4

5 Q. WHAT IS AGIS?

6 A. The AGIS initiative is a comprehensive plan that will advance the Company's

7   electric distribution system, provide customers with more choices, and enhance

8   the way the Company serves its customers. AGIS provides the foundation for

9   an interactive, intelligent, and efficient grid system that will be even more

10   reliable and better prepared to meet the energy demands of the future. The core

11   components of AGIS are the ADMS; Advanced Meter Infrastructure (AMI);

12   and the FAN. The Company has also undertaken a Time of Use (TOU) Pilot

13   program.

14

15 Q. DOES THE COMPANY PROPOSE TO RECOVER ANY AGIS CAPITAL COSTS IN THIS

16   RATE CASE FILING?

17 A. Except for certain costs related to internal labor, the Company does not seek

18   recovery of any AGIS capital costs as part of this rate case because they are

19   being recovered or have been certified to be recovered through a rider. The

20   AMI and FAN components of AGIS were certified to be included in the

21   Company's TCR Rider in the Commission's July 23, 2020 order accepting the

22   Company's Integrated Distribution Plan filed in Docket No. E-002/M-19-666.

23   ADMS and the TOU Pilot were also previously certified by the Commission

24   and costs were approved for recovery under the TCR Rider. The Company

25   intends to continue seeking recovery of these capital and O&M costs via the

26   TCR Rider through the term of the MYRP. Mr. Halama discusses the interplay

27   between riders and base rates in his Direct Testimony.

1 Q. WHAT INTERNAL LABOR COSTS RELATED TO AGIS DOES THE COMPANY SEEK
2   TO RECOVER IN THIS RATE CASE FILING?

3 A. Because the Commission has generally disallowed cost recovery of capitalized
4   internal labor costs in riders, the Company proposes to recover these costs
5   through base rates. These costs include labor costs for various positions that
6   the Company is capitalizing because the costs are related to adding capital
7   components for AGIS, such as director and management level positions,
8   engineers, project managers that are responsible for deployment, analysts that
9   support specific functions, field technicians that conduct various studies and
10   mount devices, and labor costs for design work and business networking teams,
11   including firewall support. In addition, internal labor costs provide oversight
12   of work conducted by contractors that the Company also relies on to implement
13   the AGIS program. Below, I also discuss certain internal labor costs that are
14   expensed rather than capitalized, and are reflected in our O&M budget. In his
15   Direct Testimony, Mr. Halama discusses how internal labor costs for rider
16   capital projects are determined by his team for purposes of base rate-setting.

17

18   **C.   Project Budgeting and Governance**

19   *1.   Methodology for Establishing a Reasonable Overall Budget*

20 Q. HOW DOES THE BUSINESS SYSTEMS AREA ESTABLISH A REASONABLE CAPITAL
21   BUDGET FOR A GIVEN YEAR?

22 A. The appropriate annual capital budget for Business Systems is based on a
23   partnership between corporate management of overall finances and the
24   business needs we identify. Company witness Ms. Melissa L. Ostrom explains
25   how the Company establishes overall business area capital spending guidelines
26   and budgets based on financing availability, specific needs of business areas, and
27   overall needs of the Company.

1   The Business Systems area itself employs a "bottom-up" approach to planning

2   for the needs our business area addresses. Business Systems will continue to

3   use a portfolio prioritization and balancing process to determine the needs we

4   must address and decide how to allocate limited funds according to the highest

5   business priorities, including the greatest demands our IT systems face in each

6   year. The portfolio is regularly prioritized and balanced to support established

7   strategic objectives using predefined portfolio management criteria, the

8   organization's desired risk profile, portfolio performance metrics, and capacity

9   constraints. These projects are then rolled up to total budgeted costs by capital

10   budget groupings. Often the desired initial budget exceeds the spending

11   guidelines, which then requires review meetings with managers, directors, and

12   vice presidents to assess the requested budget and determine the right course of

13   action.

14

15   Because this happens throughout the Company, a higher or lower percentage

16   of the Company's overall resources may be allocated to Business Systems in any

17   given year, depending on the priority of needs throughout the Company.

18   Ultimately, corporate leadership determines the amount of money to be

19   allocated to Business Systems for each year, as part of the total budget

20   development for the Company.

21

22   Q.   HOW DOES BUSINESS SYSTEMS MANAGE ITS BUDGETED PROJECTS TO THE

23   OVERALL CAPITAL BUDGET ALLOTTED TO IT?

24   A.   Once the Business Systems allotment is known, Company leadership has final

25   approval for either maintaining the portfolio "as is" or adjusting the portfolio

26   within the established budget thresholds as part of a formal Technology

27   Investment Governance (TIG) process. The purpose is to determine whether

1   the projects included in the budget are sound, viable, and worthy of funding,
2   support, and inclusion in the Company's IT portfolio. The process of adjusting
3   the portfolio may include:

4   • adding new projects that have been selected and prioritized for inclusion
5   in the budget;

6   • identifying projects that are not authorized based on the review process;
7   or

8   • eliminating projects to be suspended, reprioritized, or terminated based
9   on the review process.

10

11   The TIG process and its "Gated" approval procedures are presented in more
12   detail in Exhibit___(MOR-1), Schedule 5.

13

14   *2.   Changes in Planned Projects*

15   Q. AS A PROJECT MOVES THROUGH DEVELOPMENT, DOES BUSINESS SYSTEMS TAKE
16   STEPS TO MONITOR VARIANCES BETWEEN ITS ACTUAL EXPENDITURES AND ITS
17   BUDGET?

18   A. Yes. In each key area of Business Systems, management monitors actual versus
19   budget expenditures for both capital and O&M on a monthly basis. Any
20   deviations are then evaluated to determine whether costs are appropriate. In
21   addition, action plans are developed to mitigate variations in actual to budgeted
22   expenditures. These mitigation plans may either reduce or delay other
23   expenditures to support the overall authorized budget. If authorized budget
24   adjustments are required, they are identified and approved at an appropriate
25   level of management.

1   Q.   DOES BUSINESS SYSTEMS ALSO ENCOUNTER TIMES WHEN IT MUST CHANGE
2   PROJECT PLANS?
3   A.   Yes. For some projects, the complex nature of the project implementation and
4   long lead times mean we must plan for the project and carry it out over a long
5   period of time.   In these situations, we may need to adjust project cost
6   expectations, timelines, or scope as the details and design of the project become
7   more certain over time.
8
9   Other projects may have shorter lead times, a lower priority, or other reason
10   why they are important but could be delayed if a higher priority comes to light.
11   However, we remain obligated to manage to our budget and use the TIG
12   process to re-prioritize projects within a year to stay within our overall budget.
13
14 Q.   IF PROJECT PLANS NEED TO CHANGE, DO CHANGES IN PROJECT METRICS PRIOR
15   TO IN-SERVICE REQUIRE APPROVAL FROM THE TIG PROCESS?
16 A.   Yes. Any change to the budget, schedule, or scope of a project must be
17   approved by the TIG process to ensure that the change is necessary and well-
18   documented and brought forward to TIG process leadership.
19
20   We must seek approvals in addition to the TIG process, including possibly
21   Corporate Governance approval, if costs of larger projects exceed certain pre-
22   approved levels.

1   Q.   PLEASE EXPLAIN THE PROCESS TO ACCOMMODATE NECESSARY UNFORESEEN

2   CAPITAL INVESTMENTS THAT OCCUR DURING THE PLANNED CAPITAL

3   INVESTMENT YEAR.

4   A.   We utilize the portfolio prioritization and balancing process to evaluate new

5   demand or changes to existing project budgets and determine the most

6   appropriate course of action. Newly identified projects must still proceed

7   through the Gates process and may push other projects further down the

8   priority list. In other situations, we may be able to accommodate a new project

9   or expanded project scope or cost by approving an appropriate distribution of

10   funds from Emergent Demand.

11

12   Q.   WHAT IS EMERGENT DEMAND?

13   A.   Emergent Demand is a capital investment category created to ensure we are

14   able to meet the unanticipated aging technology, cyber security threats, and

15   efficiency needs that inevitably emerge in each year. Given the ever-changing

16   nature of technology and emerging risks, it is not possible to identify all projects

17   that may arise or become critical in a given year. For example, it is not always

18   possible to predict what kind of security risk might be created by hackers as

19   technology continues to develop. In other situations, as we develop a project

20   with a particular scope, we may determine that additional benefits or long-term

21   cost savings could be captured by expanding the scope of the project. Emergent

22   Demand allows the Company to address such issues without necessarily

23   delaying or cancelling previously-planned projects or otherwise absorbing

24   unplanned work and costs.

1   Q.   Are there ever instances where the Company plans more projects

2   than it may be able to complete in a year?

3   A.   Yes. As I discuss in more detail later in my testimony, the demand for IT

4   projects is significantly greater in any given year than the Company can fund.

5   For 2022, the budget currently includes an adjustment to Emergent Demand to

6   make our total Business Systems budget for the test year consistent with what

7   we intend to place in service. This "credit" approach is beneficial to customers,

8   as the Business System budget reflects the actual planned capital additions for

9   Business Systems that the Company can currently fund, which the Company

10   believes to be conservative compared to IT project demand. If the Company

11   ultimately allocates more dollars based upon Company and customer needs, so

12   that all projects can be completed, this will also benefit customers in that the

13   Company would be funding projects above our cost recovery request in the

14   2022 test year.

15

16   *3.   Capital Cost Controls*

17   Q.   In addition to the TIG process, does Business Systems undertake

18   other ongoing steps to control its costs?

19   A.   Yes. Business Systems is continually taking steps to control costs. These efforts

20   may include: increasing or decreasing the scope of outsourced services

21   increasing or decreasing the use of consultants; and changing service providers.

22   We also use competitive bidding practices and a multi-vendor sourcing strategy

23   where possible, which enables the Company to utilize a combination of internal

24   and external resources to minimize costs and maximize efficiencies in running

25   our systems. In addition, Business Systems actively interacts with other IT

26   organizations to learn how they control costs.

1   Q.   CAN YOU PROVIDE MORE INFORMATION ABOUT THE COMPANY'S COMPETITIVE

2   BIDDING PRACTICES?

3   A.   Yes. Wherever possible, for the Company's key capital projects, the project

4   team used, or will use, a competitive bid process to ensure that: (1) costs remain

5   in-line with the approved budget; (2) Xcel Energy receives quality service at a

6   fair price; and (3) business value is delivered per the agreed requirements. In

7   addition, the project costs and schedules for these projects were based on

8   internal experience with similar implementations and, in most cases, coupled

9   with input from third-party consultants who we commissioned to ensure that

10   the projects will deliver functionality that supports organizational objectives.

11

12   Generally, the only times a competitive bid process cannot be used are: (1)

13   during upgrades to software or hardware components already provided by a

14   vendor, in which engaging other providers would require a complete system

15   overhaul; or (2) the limited times when multiple vendors are not available to

16   undertake the necessary work or provide the necessary technology.

17

18 Q.   CAN YOU IDENTIFY OTHER SPECIFIC COST CONTROL MEASURES THE COMPANY

19   HAS UNDERTAKEN TO MANAGE COSTS?

20 A.   Yes. When appropriate we renegotiate contracts with key vendors and use a

21   multi-vendor sourcing strategy to maintain competition between vendors for

22   our business. One new example is our increased use of fixed bid versus time

23   and materials agreements with vendors for project delivery activities. This

24   improvement places a shared burden on the service providers to ensure costs

25   remain within the expected totals.

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1   Q. CAN YOU EXPLAIN IN MORE DETAIL WHY A MULTI-VENDOR SOURCING

2   STRATEGY IS BENEFICIAL?

3   A. Yes. Business Systems relies on approximately 50 different vendors for the

4   majority of the capital investments and O&M support, with our top ten vendors

5   comprising approximately 89 percent of our total costs. By utilizing multiple

6   vendors, we require these vendors to compete against each other for our

7   business and create an incentive to keep the price of their services competitive.

8   Overall, we are constantly managing spending, ensuring alliance with our

9   budget, and looking for opportunities to control or reduce costs.

10

11   *4.   Cost Allocation to the Company and Overall Reasonableness*

12 Q. HOW DO CAPITAL PROJECTS EXECUTED BY BUSINESS SYSTEMS AFFECT THE

13   STATE OF MINNESOTA ELECTRIC JURISDICTION FROM A COST ALLOCATION OR

14   ASSIGNMENT PERSPECTIVE?

15 A. Many of the Business Systems projects are planned and budgeted at the Xcel

16   Energy Services or operating company level, and implemented throughout our

17   system. Most projects benefit multiple jurisdictions – as when we implement

18   new software throughout Xcel Energy – and therefore must be allocated or

19   assigned to the appropriate operating companies.

20

21   In instances where a project is more fully dedicated to the Minnesota

22   jurisdiction, a greater portion of the project costs may be assigned to

23   Minnesota. In some cases where projects are dedicated wholly to Minnesota,

24   as with the land mobile radios we purchased specifically for our nuclear plants

25   discussed in our 2016 rate case, those costs may be directly assigned to

26   Minnesota. As I noted earlier in my Direct Testimony, capital additions in my

27   testimony are stated at the NSPM (Total Company) level, including electric and

1   common projects but excluding any gas-only projects. Overall, Xcel Energy

2   cost allocations are discussed by Company witness Mr. Ross L. Baumgarten.

3

4 Q. Is the overall level of Business Systems capital additions

5   reasonable?

6 A. Yes. In each year, Business Systems capital additions are necessary to maintain

7   stability and reliability of the IT systems used by employees to serve Minnesota

8   customers, efficiently manage business operations, protect Company data and

9   information, and meet evolving regulatory and legal requirements. Overall, they

10   support important investment strategies that focus on the key IT needs of the

11   Company and our customers while balancing the need for overall cost

12   containment and prioritization.

13

14   **D.   2022 Capital Additions**

15 Q. What capital additions is Business Systems proposing to make in 2022?

16 A. The NSPM (Total Company) Business Systems 2022 capital additions included

17   in our rate request are budgeted to be approximately $115.6 million as shown

18   in Table 6 below. These investments are presented in the budget groupings

19   aligning with the key investment needs described earlier in my testimony. This

20   includes the Emergent Demand category that exists to support project changes

21   in the other capital budget groupings. I will walk through the major projects

22   for 2022 in each grouping in this section of my testimony, focusing on the

23   capital additions.

Table 6

2022 Capital Additions

(Dollars in Millions)

2022 Categories	2022 Total
Aging Technology	$64.9
Cyber Security	17.3
Enhance Capabilities	28.3
Customer	7.9
Emergent Demand	(2.8)
NSPM Total	**$115.6**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

    1.   Aging Technology

Q. WHAT CAPITAL PROJECTS RELATED TO AGING TECHNOLOGY ARE INCLUDED IN THE 2022 TEST YEAR?

A. We anticipate a total of $64.9 million in capital additions in 2022 related to aging technology. In addition to more routine annual refresh projects, we will be placing specific projects in service that will have a significant impact on our IT across the Company. The individual projects are shown in Table 7 below. I first discuss our annual, routine refresh projects and then I walk through each of the specific refresh projects in the following testimony.

Table 7

2022 Aging Technology Capital Additions

(Dollars in Millions)

2022 Capital Additions	2022 Total
Annual Refresh	$14.8
Infrastructure Modernization	6.3
DR Technology Refresh	5.0
ISO Interface & Settlement Replacement	4.5
MT Security Computer System Upgrade	4.1
WAN NSPMN	4.0
Technology License	2.6
Oracle Exadata Refresh	2.6
Motorola Land Mobile Radio Core Upgrade	2.4
VoIP Refresh	2.0
DRMS Phase II (Demand Response Management System) Phase II	1.9
CASB beyond MCAS	1.5
2022 Oracle License	1.5
Rugged Tablets Refresh	1.3
SAP Purge Archive	1.2
Mainframe Modernization	1.2
SubTran Portal Upgrade	1.0
Facility IT Investments	1.0
Aging Technology (small investments)	5.9
NSPM Total	**$64.9**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

1   *a.   Annual Refresh Projects*

2   Q.   PLEASE DESCRIBE "ANNUAL REFRESH" PROJECTS.

3   A.   As I noted earlier in my Direct Testimony, routine refresh projects, or life-cycle

4   management projects, refer to those projects that relate to updating or

5   refreshing day-to-day technology on a routine basis. Budgets to upgrade

6   technology components on an aggregate level are based on the lifecycles

7   outlined by various original equipment manufacturers. Equipment lifecycles

8   can differ based on each category, but generally speaking most of our network,

9   server and end user computing equipment are on an approximately five-year

10   refresh lifecycle. Budgets are therefore based on refreshing approximately

11   twenty percent of most equipment each year. The funding allocated within each

12   specific group/year represents the aggregate of calculations to address two

13   needs: (a) equipment replacement as outlined above; and (b) net new

14   incremental, or "business-as-usual," growth. Routine refresh projects include

15   the annual data storage refresh, the annual network refresh, the annual PC

16   refresh, the annual printer refresh, and the annual server refresh. A summary of

17   the refreshes we plan to undertake is set forth in Table 8 below.

18

19   **Table 8**

20   **2022 Annual Refresh Capital Additions**

21   **(Dollars in Millions)**

2022 Capital Additions	2022 Total
Annual Network Refresh	$5.0
Annual PC Refresh	2.7
Annual Server Refresh	3.0
Annual Storage Refresh	3.6
Annual Printer Refresh	0.6
NSPM Total	**$14.8**

1 Q. CAN YOU DESCRIBE THE DIFFERENT TYPES OF TECHNOLOGY THAT ARE

2 COVERED BY EACH OF THESE REFRESH WORK ORDERS IN TABLE 8 ABOVE?

3 A. Yes. These refreshes cover:

4 • *Annual Network Refresh:* Planned replacement of network devices

5 (switches, routers, radios, channel banks and voice systems) due to aging

6 technology, out-of-support equipment, security vulnerabilities, and to

7 enable new required capabilities. Lifecycle management for Operational

8 Technology (OT) Modernization will help to replace and/or

9 decommision active end of life equipment. The scope of this work will

10 include LMR Radio replacements, UPS (uninterrupted power supply)

11 remediations and battery replacements. End of life devices leave our

12 network and infrastructure vulnerable; updates not installed can increase

13 security risk.

14 • *Annual PC Refresh:* Replaces aging desktop and laptop computers, as well

15 as those that are lost or inoperable. This project also provides devices to

16 new employees.

17 • *Annual Printer Refresh:* Planned replacement of aging printers that will also

18 fund printer improvements to allow widespread printer access and MDT

19 replacements.

20 • *Annual Server Refresh:* Replaces aging servers prior to failure to support

21 business growth and maintain reliability. Lifecycle management for

22 infrastructure services will help to replace and/or decommision active

23 end of life equipment including the replacement of servers and NetApp

24 licenses.

25 • *Annual Data Storage Refresh:* Replaces data storage hardware that is no

26 longer cost-effective to support, or that presents significant risk to

27 operations due to aging components or lack of vendor support.

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1   Q.   CAN YOU PROVIDE AN EXAMPLE OF HOW A REFRESH PROJECT WORKS?

2   A.   Yes. An example of this type of life-cycle management work is our Annual

3   Planned PC Refresh project, in which we conduct a planned refresh of

4   employee personal computers that are a year or more out of warranty. We use

5   a "rolling PC Lifecycle refresh" approach, which replaces approximately 25

6   percent of the desktop computers annually based on the four-year average

7   lifespan of a desktop computer. This lifecycle program was established in 2007

8   to ensure that the personal computers maintain their functionality and are

9   compatible with existing software and other systems.

10

11   Within our Annual PC Refresh list, we also know that Annual Unplanned PC

12   Refreshes will be needed. Unplanned refreshes cover PCs that must be replaced

13   outside the pre-determined rolling life-cycle refresh. These are devices that may

14   fail prematurely. It also covers new business demand, such as increases in

15   computer user headcount. The project budget is based on historical trends and

16   forecast demand growth.

17

18   Q.   CAN YOU PROVIDE MORE INFORMATION ABOUT NETWORK REFRESH WORK

19   BEING IMPLEMENTED DURING THE MYRP?

20   A.   Yes I can. For 2022-2024, the Company will also conduct network refresh work

21   that includes necessary replacement of Local Area Network (LAN) and Wide

22   Area Network (WAN) telecommunications components across the Company.

23   WAN replacements only includes hardware components for this routine work,

24   and other components are included in the WAN NSPMN project. Without

25   replacement of these telecommunications components, there would be

1   increasing instability, loss of reliability, and increasing safety and compliance

2   risks related to these network components.

3

4 Q. HOW DOES BUSINESS SYSTEMS DEVELOP ITS BUDGETS FOR REFRESH PROJECTS?

5 A. While the budget methodology varies depending on the nature of the assets to

6   be refreshed, generally a refresh budget is determined by one or more of the

7   following factors:

8   • The number of devices or systems that will reach end of life during the

9   budget period. This is typically based on an established lifecycle plan.

10   For example, PCs, mobile data terminals, and portable meter reading

11   devices have a four-year life. Thus, approximately 25 percent of them

12   are replaced in an average year.

13   • The number of devices expected to permanently fail outside warranty,

14   and in the case of portable devices, the number expected to be damaged,

15   lost, or broken. This is based on historical trends.

16   • Planned incremental growth in demand (e.g., data storage, network

17   bandwidth, number of computer users, new physical sites, etc.). This is

18   based on Company and industry trends and known business plans.

19   • The devices or systems that must be replaced to meet new security,

20   software compatibility, or business requirements.

21   • The devices or systems for which vendor support will cease or become

22   prohibitively expensive.

23

24   Overall, these refresh efforts result in an orderly, thoughtful, and cost-

25   effective means of managing aging technology while harvesting value from

26   investments to the extent possible.

1		*b.* *Infrastructure Modernization*

2   Q.   PLEASE DESCRIBE THIS PROJECT.

3   A.   This is a multi-year project that is made up of four major components that are
4   intended to support our overall technology infrastructure:

5   •   *Server OS Refresh*: There are Windows servers still using 2012 (or older)
6   Operating Systems (OS) that need to be updated to a new version of
7   Microsoft Server. This project involves managing the application teams
8   to review their needs for the application residing on older Windows
9   Server OS; if assessment reveals the need to migrate to a more current
10   version, a migration strategy is created and executed to more current
11   Windows Server OS. In some cases, it may be necessary to move to new
12   infrastructure and away from physical servers to virtual machines (VM).
13   VMs provide the functionality of physical assets through the use of
14   specialized hardware and software.

15   •   *Tanzu*: This part of the effort will institute Tanzu, a container-hosting
16   platform that helps our servers communicate with each other and enable
17   Xcel Energy to modernize both its applications and the infrastructure it
18   runs on. Similar to the way VMware prefers to have vRealize to be
19   synonymous with cloud management and automation, the goal is to have
20   Tanzu be synonymous with modern applications in the enterprise.

21   •   *Monticello Nuclear Plant Data Center Upgrade*: The Prairie Island Nuclear
22   Plant Data Center was upgraded 3 years ago and now the Monticello
23   Nuclear Generating Plant Data Center is due for an upgrade, which
24   involves modernization of the storage and backup systems, conversion
25   to VM infrastructure to support the nuclear plant, and a redesign of the
26   electrical systems in Monticello at its data center.

1		*c.*	*Disaster Recovery (DR) Technology Refresh*

2   Q.   PLEASE DESCRIBE THIS PROJECT.

3   A.   This project will enable the Company to proactively test and implement a new

4   methodology for system recovery during a disaster such as power outages and

5   other system failures that can result in lost data and system issues. The project

6   will help ensure business continuity, regardless of the circumstances. The DR

7   Technology Refresh will replace aging disaster recovery hardware and will

8   provide hardware and software solutions to ensure that the Company will be

9   fully prepared to operate during a situation that could negatively impact the

10   operation of the Company's primary systems. This is a multi-year project with

11   various components that will be placed in service as assets are deployed.

12

13   *d.*   *ISO Interface & Settlement Replacement*

14   Q.   PLEASE DESCRIBE THIS PROJECT.

15   A.   The Power Costs, Inc. (PCI) software is used to facilitate transactions with the

16   Independent System Operators (ISOs), among other uses. The current PCI

17   software support costs have increased, and the technology is nearing end of life.

18   The required market interface capability was evaluated through a request for

19   information (RFI) and it was determined through the RFI that Xcel Energy

20   could increase market interface capability and reduce support costs by replacing

21   the technology. The replacement of PCI with the new product will increase

22   processing speeds with real-time market bidding process transactions, enable

23   better asset optimization, and enable a robust analysis and reporting function

24   for settlement for all markets.

1   *e.   MT (Monticello) Security Computer System Upgrade*

2   Q.   PLEASE DESCRIBE THIS PROJECT.

3   A.   The Security Computer System (SCS) is the heart of physical security for the

4   existing nuclear facility located in Monticello. It performs many of the security

5   functions for the facility including door locking/control, hand-geometry

6   verification, alarming to Security officers, video call-ups for alarms, etc. The

7   existing SCS was installed in 2014. The life span for these systems is

8   approximately 7-8 years based on hardware/software lifecycles. When the

9   hardware and software components are end-of-life or unsupported, then the

10   site will be unable to maintain the system to meet cyber security compliance and

11   actual risk of a cyber security and/or physical security events.

12

13   To continue to maintain the system and remain in compliance with Regulatory

14   Cyber Security requirements as set forth in 10 C.F.R. § 73.54, the system must

15   be upgraded with supported hardware (Servers, Workstations, Network

16   Switches, etc.) and software (Windows Operating System, ARINC's Advanced

17   Information Management software, etc.). Additionally, any time the system is

18   in operation, it requires significant security compensatory measures and

19   additional man-hours along with the actual increased security risk. As the

20   hardware and software are no longer supported, the likelihood of failures and

21   potential recovery time increases.

22

23   *f.   Network Infrastructure Investments (WAN NSPMN)*

24   Q.   PLEASE DESCRIBE THIS PROJECT.

25   A.   This project includes the detail design, planning, installation and commissioning

26   of equipment that comprises an expansion and privatization of the Company's

27   corporate WAN across our service territories. The WAN work includes

1   network infrastructure investments to support connection between the
2   Company's various locations together and providing the pathway to enable
3   critical business services. Investments support communication services for our
4   business and substations, including the SCADA connectivity for monitoring
5   and control of the grid. In addition, enterprise services are delivered to enable
6   end users to connect to corporate applications like email, SAP (the GL and
7   WAM systems), and internet access. For 2022-2024, the project focus is to
8   support Analog circuit replacement (retirement of copper circuits), new
9   substations, and new wide area network which supports virtual hosting and
10   windfarms. This is a multi-year project, with various components placed in
11   service as assets are deployed.

12

13   *g.   Technology License Project*

14 Q. PLEASE DESCRIBE THIS PROJECT.

15 A. This project provides software license support across enterprise infrastructure
16   and operations for the 2022 test year. To ensure adequate coverage, the
17   Company will purchase additional licenses to support new and increasing
18   numbers of licenses for common systems, such as Microsoft and Oracle, with
19   users usually not tied to specific projects. Updating software licenses ensures
20   that system devices are not over purchased and are running up-to-date licensed
21   software, which decreases support costs and increases the Company's cyber
22   security profile.

23

24   *h.   Oracle Exadata Refresh*

25 Q. PLEASE DESCRIBE THIS PROJECT.

26 A. This project will deploy a new Oracle Exadata database platform that will
27   replace the existing platform, which will reach the end of its life in 2021. Oracle

1		Exadata is a software and hardware computing platform that runs Oracle
2		Database for over 100 applications to store and organize data, which provides
3		IT infrastructure for enterprise grid computing that manages information and
4		applications for the Company in a flexible and cost-effective way. In addition,
5		the Oracle Database will be upgraded to a new version in order to maintain
6		vendor support and security patching. The Oracle Exadata platform also
7		supports many other databases, including critical application databases.
8		
9		*i. Motorola Land Mobile Radio (LMR) Core Upgrade*
10	Q.	PLEASE DESCRIBE THIS PROJECT.
11	A.	When there is no cell phone coverage, the only means of communications for
12		workers out in the field is the LMR system, which is critical to the safety and
13		productivity of Xcel Energy's field personnel. This project will complete all
14		software and hardware updates to the current LMR system to remain in support,
15		which allows for patching, improved support from Motorola, and proper
16		adherence to security standards.
17		
18		*j. VoIP Refresh*
19	Q.	PLEASE DESCRIBE THIS PROJECT.
20	A.	This project will upgrade Company technologies for the delivery of voice
21		communications over the Internet. This refresh project represents both
22		replacing legacy communications systems and upgrading to more modern VoIP
23		(Voice over Internet Protocol) communication systems.

1   *k.* *DRMS Phase II (Demand Response Management System) Phase II*

2 Q. PLEASE DESCRIBE THIS PROJECT.

3 A. The DRMS Phase II project will replace the old/retiring systems by

4   implementing platform components required to manage demand response

5   dispatches for all programs, customer segments, and endpoints. The platform

6   will manage events, control related endpoints, monitor participation, and

7   retrieve related meter data. The platform will also provide integrations to Xcel

8   Energy customer and program management systems, meter data systems, and

9   billing systems. This project will employ a new DRMS that will provide Xcel

10   Energy with the capability to create innovative new demand response programs

11   to increase customer choices and to adapt to changing regulatory requirements.

12   The new DRMS will work with AGIS and AMI infrastructure investments in

13   order to provide value to our customers for those seeking to take advantage of

14   demand response programs.

15

16   *l.* *CASB beyond MCAS*

17 Q. PLEASE DESCRIBE THIS PROJECT.

18 A. This project will implement a cloud access security broker (CASB), specifically

19   the Microsoft Cloud App Security (MCAS). This will identify and help combat

20   cyber threats. It improves visibility and mapping functions into our cloud

21   applications, allowing the teams to see things like data travel, ensuring security

22   and compliance across the entire base of SaaS (software as a service) apps.

23

24   *m.* *2022 Oracle License*

25 Q. PLEASE DESCRIBE THIS PROJECT.

26 A. For 2022, this licensing work relates to the Company's upgrade of the Oracle

27   database across the Xcel Energy enterprise as the current version of the Oracle

1   database was at end of life and no longer supported by Oracle. Xcel Energy

2   renegotiated its Oracle Perpetual Unlimited License Agreement (PULA) in

3   2021, which will lock in licensing pricing for five years and will ensure licensing

4   requirements compliance with Oracle. The Oracle database supports many

5   Xcel Energy critical systems.

6

7   *n.   Rugged Tablets Refresh*

8   Q.   PLEASE DESCRIBE THIS PROJECT.

9   A.   "Rugged" tablets, or Mobile Device Terminals (MDTs), are generally used by

10   Xcel Energy critical employees in the field in the areas of Distribution,

11   Construction, Transportation, Emergency, Trouble, in both the electric and gas

12   jurisdictions. Field supervisors and other skilled staff use MDTs to receive and

13   complete work orders in the field in real-time. Devices that need to be replaced

14   have not been refreshed in four to six years. These refresh implementations are

15   for 2022 and continue into future years as needed.

16

17   *o.   SAP Purge Archive*

18   Q.   PLEASE DESCRIBE THIS PROJECT.

19   A.   This project will deploy a solution to appropriately archive Company data that

20   is ever-growing and which has begun to impact system performance in some

21   cases. The solution will archive data through tiered storage levels in order to

22   better balance archival data needs while lowering costs and ensuring system

23   performance and complying with legal data retention requirements.

1   *p.   Mainframe Modernization*

2   Q.   PLEASE DESCRIBE THIS PROJECT.

3   A.   There are core applications running on a mainframe that was placed in service

4   over eight years ago and is now out of support. This project is to replace the

5   existing mainframe and Disaster Recovery with a solution that meets the needs

6   of Xcel Energy.

7

8   *q.   SubTran Portal Upgrade*

9   Q.   PLEASE DESCRIBE THIS PROJECT.

10   A.   The SubTran Portal application is used by the Transmission organization to

11   generate, validate, and store Xcel Energy Facility Ratings in order to comply

12   with NERC Standards FAC-008. The current application the Transmission

13   organization uses is no longer supported by the vendor, which increases NERC

14   compliance risk if there were to be an issue with the current version because

15   patches are no longer available. In addition, an upgraded SubTran Portal

16   application will be able to better and more efficiently calculate Facility Ratings

17   and comply with changes to methodologies for calculating ratings, which under

18   the current version, inputs must be hard coded in order to calculate ratings,

19   making adjustments more difficult and time intensive.

20

21   *r.   Facility IT Investments*

22   Q.   PLEASE DESCRIBE THIS PROJECT.

23   A.   New service centers or offices are built as needed to support growing or

24   expanding communities. Facility IT investments represent the necessary IT

25   network infrastructure needed to connect these sites. This includes the

26   construction of main distribution frames, intermediate distribution frames,

27   cabling to connect workstations and phones, deployment of wireless access

1   points, and the installation of any routers, switches and/or firewalls to secure

2   the site. This is a multi-year project that continues with implementations in

3   2023.

4

5   *2.   Cyber Security*

6   Q.   WHAT CAPITAL PROJECTS RELATED TO EVOLVING CYBER SECURITY THREATS

7   AND REQUIREMENTS ARE INCLUDED IN THE 2022 TEST YEAR?

8   A.   We anticipate a total of $17.3 million in capital additions in 2022 related to cyber

9   security as shown in Table 9 below. I discuss the projects that comprise the

10   majority of the 2022 cyber security capital additions in the following testimony.

11

12   **Table 9**

13   **2022 Cyber Security Capital Additions**

14   **(Dollars in Millions)**

15

2022 Capital Additions	2022 Total
SIEM+SOAR	$3.4
Firewall Rule Management	2.7
OT Shared Services	1.5
Vulnerability Scanning Refresh	1.1
Service Delivery Security Remediation	1.0
Cyber Security (small investment)	7.7
NSPM Total	**$17.3**

*There may be differences between the sum of the individual category amounts
and Total amounts due to rounding.

23

24   Q.   WHAT IS THE SIEM+SOAR PROJECT?

25   A.   This project will implement and operationalize a combined suite of software

26   products for Security Information and Event Monitoring (SIEM), User

27   Behavior Analytics (UBA), and Security Orchestration, Automation, and

1   Response (SOAR) for the Enterprise Command Center (ECC) that once

2   implemented will increase and establish their cyber security capabilities. This

3   project will mature and expand security capabilities and will provide benefits by

4   more effectively and seamlessly protecting the Company from threats to its

5   systems and allow it to better correlate and analyze a growing volume of data

6   within the environment in a fast, accurate, and efficient manner by having the

7   various capabilities of these programs in a common stack.

8

9   Q.   PLEASE DESCRIBE THE FIREWALL RULE MANAGEMENT PROJECT.

10 A.   This project will implement a new centrally-managed tool to maintain the

11   Company's multi-vendor firewall hygiene program by providing end-to-end

12   security views of firewall policies, rules, and configurations that impact the

13   Company's security posture in an automated fashion.

14

15 Q.   WHAT IS THE OT SHARED SERVICES PROJECT?

16 A.   The OT (Operational Technology) Shared Services project consists of

17   investments in the operational technology environment that are needed to

18   support AGIS and operations applications, such as substation, synchrophasor,

19   and the DEMS. This project will reduce operational technology and regulatory

20   business risks for enterprise strategic initiatives while providing value by

21   supporting this environment with shared services.

22

23 Q.   WHAT IS THE VULNERABILITY SCANNING REFRESH PROJECT?

24 A.   The project will refresh the Company's vulnerability scanning capabilities in

25   accordance with Xcel Energy's Security Standards. This specific refresh project

26   will improve the Company's security posture and reduce the risk of data loss or

1   breach of the Company's systems and is designed to increase the Company's

2   security audit scores by increasing its security posture.

3

4 Q. WHAT IS THE SERVICE DELIVERY SECURITY REMEDIATION PROJECT?

5 A. This project work is necessary to ensure that the Company is compliant with

6   Enterprise Information Security and Technology Standards. This work will

7   consist of security remediation projects that will ensure compliance.

8

9 Q. PLEASE DESCRIBE OTHER CYBER SECURITY PROJECTS THAT THE COMPANY IS

10   PLACING IN SERVICE IN 2022.

11 A. These projects include investments that provide prevention, detection,

12   containment, and corrective services to protect the Company from security

13   incidents, and assist in the recovery from any adverse events. It is imperative

14   to refresh our technology to ensure continued compliance with regulatory

15   requirements for customer data and overall corporate security objectives, while

16   reducing our business's and our customers' exposure to evolving cyber security

17   risks and vulnerabilities.

18

19   Examples of smaller 2022 projects include the Verint Security Camera Server

20   Replacement, Data Loss Prevention work, Mandiant Security Validation,

21   Enterprise File Encryption, Nuclear WiFi expansion, PingFed MDHA, Xcel

22   Energy Nuclear Drone Analysis, Advanced Endpoint Protection and Response,

23   and other smaller cyber security projects. Cyber security investments support

24   the availability, integrity, and confidentiality of our information systems, and

25   help ensure that we meet our legal and regulatory obligations and risk

26   management objectives. Continually evolving cyber security threats and

27   associated regulatory structure require ongoing investment into annual security

1   technology refreshes.

2

3   *3.   Enhancing Capabilities*

4 Q. WHAT CAPITAL PROJECTS RELATED TO ENHANCING COMPANY CAPABILITIES

5   ARE INCLUDED IN THE 2022 TEST YEAR?

6 A. We anticipate a total of $28.3 million in capital additions in 2022 related to

7   enhancing capabilities, as shown in Table 10 below. I discuss the projects that

8   comprise the majority of the 2022 enhancing capabilities capital additions in the

9   following testimony.

10

11   **Table 10**

12   **2022 Enhancing Capabilities Capital Additions**

13   **(Dollars in Millions)**

2022 Capital Additions	2022 Total
EXT Mobile Application Development	$8.5
Electronic Work Package (eWP)	3.0
SAP Continuous Improvements Placeholder	2.3
NAD Server Refresh	1.7
Transmission Asset Health Analytics (TAHA) PH2	1.4
Enterprise Metadata Management	1.1
Employee Digital Experience Intranet Platform	1.1
Enhancing Capabilities (small projects)	9.2
NSPM Total	**$28.3**

*There may be differences between the sum of the individual category amounts
and Total amounts due to rounding.

23

24 Q. WHAT IS THE EXT (EMPLOYEE EXPERIENCE TRANSFORMATION) MOBILE

25   APPLICATION PROJECT?

26 A. The EXT program is building mobile applications for employees. The initial

27   focus is on improving the employee experience for our field workers with apps

1   such as Field Time Entry, Electric Outage Restoration, and Gas Emergency

2   Response. This project is a new platform that will provide "backend" support

3   for all mobile applications within the EXT portfolio. This project will enhance

4   the Company's mobile applications capabilities, providing components such as

5   authentication and authorization services, notification services, logging and

6   monitoring services, integrations, and processes for developer operations. By

7   equipping employees with more modern, convenient mobile apps, it allows

8   them to be more effective in their jobs and improve delivery of services for

9   customers.

10

11   Q.   WHAT IS THE ELECTRONIC WORK PACKAGE PROJECT?

12   A.   Electronic Work Packages, or eWPs, are electronic, mobile versions of physical

13   work processes, such as documenting maintenance activities. eWPs have the

14   ability to significantly enhance worker productivity, such as at our nuclear

15   facilities, by integrating traditional work flows with electronic work processes.

16   eWPs also have the ability to significantly decrease O&M costs, such as labor

17   costs and paper costs, through more efficiently and enhancing worker

18   capabilities through the use of eWPs. The Company is particularly interested

19   in facilitating "smart" procedures, such as Adaptive Dynamic procedures, into

20   selected work processes through the use of eWPs. Thus, implementing eWPs

21   into select, labor-intensive work flows has the opportunity to significantly

22   reduce costs while increasing productivity.

23

24   Q.   WHAT IS THE SAP CONTINUOUS IMPROVEMENTS PROJECT?

25   A.   SAP is an enterprise application and continuous improvement and investment

26   is needed to fully utilize the benefits of having an enterprise application. This

27   is a multi-year project, with various components placed in service as assets are

1   deployed. Examples of some of the components for this project include the

2   Batch Management Tool that SAP supplied and released that allows for

3   increased traceability of inventory and group management of inventory in our

4   Energy Supply area, the Oracle Database upgrade, which is the primary database

5   for SAP, and SAP scheduler was upgraded to improve scheduling to monitor

6   and improve inefficiencies to optimize resources.

7

8 Q. WHAT IS THE NUCLEAR ANALYSIS DEPARTMENT (NAD) SERVER REFRESH

9   PROJECT?

10 A. This project is a specific refresh of the NAD UNIX servers, which are

11   approaching end of life. The current servers will be approximately eight years

12   old in 2022, which is past the time when these servers begin having large

13   numbers of failures. The NAD server refresh project will replace these servers

14   to maintain reliability. The associated software also periodically needs to be

15   upgraded.

16

17 Q. WHAT IS THE TRANSMISSION ASSET HEALTH ANALYTICS PROJECT PHASE 2?

18 A. This project will provide a Transmission Asset Health Analytics (TAHA) system

19   that will combine different types of asset data and capabilities to perform data

20   mining, predictive modeling, and advanced analysis that will assist the Company

21   with accurately maintaining and replacing transmission assets.

22

23 Q. WHAT IS THE ENTERPRISE METADATA MANAGEMENT PROJECT?

24 A. This project will deploy new software to enable metadata management across

25   Xcel Energy and will enable numerous capabilities for metadata management

26   and standardization. It will enable the management and publishing of

27   consistent metadata definitions across the Company. It will also leverage the

1   correct metadata and integrate the Company's systems in order to make

2   effective data-driven decisions. This project will also facilitate standardizing

3   metadata for business master data and standardize and consolidate among

4   various sources from programs such as Microsoft Word and Excel.

5

6 Q. WHAT IS THE EMPLOYEE DIGITAL EXPERIENCE INTRANET PROJECT?

7 A. Large companies like Xcel Energy generally have intranet websites designed to

8   facilitate employee communications, provide necessary information to

9   employees, and to help facilitate how we serve our customers. This project will

10   replace the current intranet site with a modern, more enhanced version that will

11   enable Company employees to more productively and more efficiently

12   communicate with other employees in a work environment that is ever more

13   mobile and "deskless." This project will also act to lower costs and streamline

14   Company intranet by having one, modern intranet site for all business areas.

15

16 Q. WHAT ARE OTHER PROJECTS TO ENHANCE CAPABILITIES THAT ARE BEING

17   PLACED IN SERVICE IN 2022?

18 A. The Company is also placing in service many other smaller projects in 2022 that

19   will enhance the Company's capabilities. These smaller projects, like large

20   projects, also enable the Company to improve productivity, enhance

21   communications between systems, and between people, and use data more

22   efficiently. Examples of these projects are the MDO (Master Data Online)

23   Supply Chain Implementation, ServiceNow Enhancements, FERC Cost

24   Traceability Process Improvements, Kafka Expansion, and the Alteryx Server

25   project.

1   *4.   Customer Experience*

2   Q.   WHAT CAPITAL PROJECTS RELATED TO ENHANCING THE CUSTOMER

3   EXPERIENCE ARE INCLUDED IN THE 2022 TEST YEAR?

4   A.   We anticipate a total of $7.9 million in capital additions in 2022 related to

5   customer experience. The individual projects are shown in Table 11 below. I

6   describe the majority of work that encompasses customer experience projects

7   in the following section of my testimony.

8

9   **Table 11**

10   **2022 Customer Experience Capital Additions**

11   **(Dollars in Millions)**

2022 Capital Additions	2022 Total
CXT Budget	$4.2
CRS Application upgrade	1.7
Customer Service Console - Single Screen	1.2
Customer Experience (small investments)	0.7
NSPM Total	**$7.9**

*There may be differences between the sum of the individual category
amounts and Total amounts due to rounding.

18

19   Q.   WHAT IS THE CXT BUDGET PROJECT?

20   A.   The Company's work to improve the customer experience has been divided

21   into four project areas: (1) Digital Channel Platforms (including MyAccount,

22   the Company's website, Xcel Energy mobile applications, and new customers

23   and real estate developers' initial connections with the Company (Customer

24   Connect); (2) the Customer Relationship Management (CRM) Platform

25   (currently Salesforce); (3) Platform Infrastructure and Technology Maintenance;

26   and (4) Data Analytics and Automation. This capital additions for 2022 within

27   the CXT budget will continue CXT implementations by adding experiences and

1   capabilities to the core CXT program. In successive years, we will add
2   components to the foundational investments in order to build out the overall
3   customer program to better serve and meet our customers' service expectations.
4
5   Specifically, for 2022, the Company continues building out the CRM platform
6   and introduces new next-generation modules to the CXT platform to better
7   serve our customers. The redesigned platform will enable us to track the
8   different relationships with our customers, whether that is commercial,
9   residential, industrial or on a different basis, with a goal of reducing O&M spend
10   across high-cost channels and improve customer satisfaction. With a project of
11   the size and scope of CRM, we also need to budget for post-implementation
12   enhancements that play a critical role in supporting the overall CXT program.
13   The CRM project built out the existing Salesforce CRM tool and introduced
14   new modules to better understand and serve customers. Overall, these capital
15   additions reflect continuation of the customer experience projects from
16   previous years.
17
18   Additionally, we will continue to add customer experiences to the CXT
19   platform, including enhancing our outages and notifications functions. In
20   addition, we will have self-service capabilities, such as enrolling in services
21   online and status of technicions. The outage work created a new, multi-channel
22   outage experience for our customers that displays more accurate and timely
23   outage information, and includes supporting more accurate restoration
24   information. When merged with interval data from AMI meters, a new outage
25   experience is much more personal and will give customers the information they
26   want when they need it. Outage work for 2022 provide a new outage

1   communications module that will better communicate outage information to
2   our customers.

3

4   Notifications work provides new capabilities within the Customer Relationship
5   Management (CRM) platform that allow the Company to provide more accurate
6   and proactive customer event notifications for billing and payments, outages, ,
7   and other customer journeys. The new notifications approach will create more
8   opportunities for communicating with customers, such as enabling two-
9   directional text, and opening up a new channel for customers to pay their bills
10   and to work with an agent in the future. Notifications work for 2022 will
11   continue moving to a scalable solution that affords more experiences for our
12   customers.

13

14   In 2022, we also implement new experiences for our New Customer Connect
15   (NCC) platform (now called Builders and Remodelers Portal). This portal
16   provides a better experience for builders, developers, and other larger
17   Commercial & Industrial customers who engage with Xcel Energy to request
18   new, resumed, or stopped service. The Company has already revamped the
19   customer interface by providing better information to customers about the
20   phase or status of their line extension process, improved the builders' call line,
21   and improved the process for communicating with parties engaged in that
22   process.

23

24   Finally, we are adding capabilities to our MyAccount platform. The MyAccount
25   re-platform has already provided more enhancements for our customers, such
26   as allowing for customers to set up their preferences, pay their bills or set up
27   automatic payment options, and to receive information on their energy usage.

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1   For 2022, we implement new experiences for our customers, such as improved

2   billing features in MyAccount that will be more user friendly and intuitive.

3

4   Q.   WHAT IS THE CRS APPLICATION UPGRADE PROJECT?

5   A.   The CRS is the Company's customer information system, which generates

6   billing statements to retail customers on a monthly basis. This project is the

7   initial strategy and first of a few projects that will remediate the larger CRS

8   application that is supported by various software components, including those

9   implemented under the CRS Tech Stack work, which is included among the

10   small customer experience projects for 2022. The replacement will enable the

11   Company to continue to maintain the stability, reliability, security, resilience,

12   and efficiency of the CRS application. The remediation effort is continued in

13   the Meter-to-Receipt Resiliency Phase II project in 2023, described later in

14   testimony.

15

16   Q.   WHAT IS THE CUSTOMER SERVICE CONSOLE - SINGLE SCREEN PROJECT?

17   A.   This project represents a component of the core CXT platform that has not yet

18   been implemented. Currently, Company call center agents utilize numerous

19   screens when communicating with customers on the phone. Combining

20   numerous screens into one screen that contains all the information needed for

21   customer service agents will simplify the experience for employees and benefit

22   customers who will receive the information they need more quickly and

23   efficiently. The "Single Screen" work, or also referred to as Agent 360, will also

24   be integrated with Artificial Intelligence capabilities to help decipher what the

25   inbound call is most likely about, and help identify the most immediate fix to

26   the issue. In addition, the single screen will show the agent the current bill,

27   history of payments, and payment plan options that are tailored specifically to

1   the caller. Finally, this screen will suggest support offerings for the customer's

2   home that can help save money or simplify the customer's energy experience.

3   Together, our CXT investments support the Company's overall goal to enhance

4   the customer experience.

5

6   *5.   Emergent Demand*

7   Q.   DOES BUSINESS SYSTEMS HAVE CAPITAL COSTS THAT SPREAD ACROSS ALL KEY

8   BUDGET CATEGORIES?

9   A.   Yes. Given the ever-changing nature of technology and emerging cyber security

10   risks, it is not possible to identify all projects that may be needed in a given year.

11   To ensure that we are able to meet our overall objectives, a number of years ago

12   we created Emergent Demand as an efficient way to fund important and

13   unexpected projects.

14

15   Q.   HOW DOES EMERGENT DEMAND HELP ENSURE THAT BUSINESS SYSTEMS

16   MEETS ITS KEY OBJECTIVES?

17   A.   Emergent Demand provides Business Systems with the ability to assess and

18   address, as appropriate, emerging technology needs as they arise.

19

20   For instance, we may identify a risk associated with existing technology that

21   needs to be addressed earlier than initially planned. In other instances, we might

22   begin implementing new software and then learn of a new function that is cost-

23   effective to adopt at the same time the project is implemented.

24

25   Whether the funding requirement is from a scope change to an existing project,

26   or to address a new risk or a new identified need, Emergent Demand allows us

27   to effectively ensure adequate funding for projects that cannot always be

1		predicted in our fast-changing environment.
2		
3	Q.	HOW LONG HAS BUSINESS SYSTEMS MANAGED EMERGENT NEEDS OF THE
4		ORGANIZATION IN THIS WAY?
5	A.	We began specifically planning for emergent needs in this manner in 2013.,Prior
6		to creation of the Emergent Demand budget we had to delay or cancel
7		previously-planned projects or absorb unplanned work and costs when a new
8		technology or critical need was identified. These changes would often disrupt
9		the parts of the business relying on our original plan, and would impact other
10		long-term plans that affect the Company, our customers, or both.
11		
12	Q.	WHAT PROCESS WAS USED TO ESTABLISH THE TEST YEAR EMERGENT DEMAND
13		BUDGET?
14	A.	Beginning with the timeframe of our 2016 Minnesota rate case, to develop the
15		Emergent Demand budget, we reviewed our experience with emergent demand
16		and tailored the budget for future years to forecasted spending levels and in
17		alignment with overall Company budgeting. Over the last few years, the 2018-
18		2020 Emergent Demand funds were completely distributed to other projects.
19		
20	Q.	WHY IS THE BUDGET FOR EMERGENT DEMAND IN 2022 A RELATIVELY SMALL,
21		NEGATIVE NUMBER?
22	A.	Our total Business Systems budget for Emergent Demand in 2022 is $(2.8)
23		million. This credit amount reflects that we have more projects than room in
24		our total Business Systems budget for 2022, and that we will need to delay or
25		decide against undertaking a project or projects, or else allocate more funds
26		from another area to meet our budget for the year. We included a credit in

1   Emergent Demand to reflect that the specific project to be cut was not yet
2   determined as of the date this testimony was prepared.

3

4   This credit exists because the demand and need for IT solutions to address aging
5   technology, address cyber security, and enhance our capabilities across the
6   enterprise is so high, and increasing. Over the remainder of the year, either
7   additional dollars will be allocated to Business Systems to allow all projects to
8   go forward, or certain projects may be delayed to a future year such that the
9   need for a net credit in Emergent Demand will reduce to zero. Either way, this
10   credit demonstrates our focus on cost containment overall, and that Business
11   Systems will be implementing, at a minimum, its overall capital budget.

12

13   **E.   2023 Capital Additions**

14   Q.   WHAT CAPITAL ADDITIONS IS BUSINESS SYSTEMS PROPOSING TO MAKE IN 2023?

15   A.   The NSPM (Total Company) Business Systems 2023 capital additions are
16   budgeted to be approximately $196.0 million. This capital additions budget
17   includes a number of projects that are categorized in Table 12 below according
18   to the capital budget groupings described earlier in my testimony.

Table 12

2023 Capital Additions

(Dollars in Millions)

2023 Categories	2023 Total
Aging Technology	$121.2
Cyber Security	13.2
Enhance Capabilities	56.0
Customer	1.2
Emergent Demand	4.4
NSPM Total	**$196.0**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

1. Aging Technology

Q. WHAT ARE THE CAPITAL PROJECTS TO REPLACE AGING TECHNOLOGY INCLUDED IN THE 2023 PLAN YEAR?

A. We anticipate that $121.2 million will be spent to replace aging technology assets in 2023 as shown in Table 13 below. I discuss the projects that comprise the majority of 2023 capital additions in the following testimony. In addition, annual refreshes are ongoing in 2023, and are discussed in greater detail below.

Table 13

2023 Aging Technology Capital Additions

(Dollars in Millions)

2023 Capital Additions	2023 Total
DEMS Upgrade AKA Dynamic EMS (DEMS) Environment Phase 4	$27.6
Technology License	25.2
Annual Refresh	14.2
Core HR Application (Payroll Benefits)	13.5
Infrastructure Modernization	6.5
Avaya Cloud License	5.9
Prairie Island Security Computer System	4.6
WAN NSPMN	4.5
Prairie Island Process Computer System Upgrade Refresh	4.1
Transform Operational Reporting	3.7
SAS BookRunner Upgrade	2.7
2023 Oracle License	1.4
Rugged Tablets Refresh	1.3
VoIP Refresh	1.2
DR Technology Refresh	1.0
Facility IT Investments	1.0
Aging Technology (small investments)	2.8
NSPM Total	**$121.2**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

a.   DEMS Upgrade AKA Dynamic EMS Environment Phase 4

Q. PLEASE DESCRIBE THIS PROJECT.

A. DEMS is the Company's critical system for supporting transmission SCADA, Generation, Generation Dispatch, Market Participation and Reliability Coordination. The NSPM phase of this project is part of a five-year effort to replace the EMS, which is a critical technology that is used for the monitoring and management of the bulk electric system by our transmission system. The

1   EMS interfaces with field devices that collect information about the health of

2   the bulk electric system. This real-time, two-way communication provides

3   Transmission and Distribution Operations the ability to remotely control the

4   flow of electricity during outage and maintenance periods, which is a key driver

5   of our ability to maintain efficient and reliable service to our customers.

6

7   The DEMS project is primarily driven by a contractual agreement with GE to

8   upgrade DEMS to a newer version within six years of the executed contract.

9   Without an upgrade, the Company's DEMS system will not evolve with the GE

10   product, which may impact the Company's ability to get vendor support for any

11   software system issues. Additionally, there is a known risk of hardware failure

12   due to equipment and overall infrastructure being at the end of its life. The

13   upgrade will also provide enhanced capability regarding the Transmission

14   Security Model (TSM) to help reduce risk if/when field communications fail.

15   The upgrade also provides an improved security posture and will employ the

16   Company's new OT network and infrastructure. We have completed the

17   Factory Acceptance Testing (FAT) and resolved the issues identified during that

18   process. We are working to ready the new infrastructure and environments for

19   deployment; once completed we will start the work through site acceptance

20   testing (SAT), parallel testing, and resiliency testing.

21

22   b.   *Technology License 2023 (and Microsoft Windows Upgrade)*

23 Q.   PLEASE DESCRIBE THIS PROJECT.

24 A.   The project includes the annual technology licences work as I described in

25   2022. In addition, in 2023 we have planned a major refresh of licenses for

26   years 2023-2028 with Microsoft to remain current and upgrade to the latest

1 Windows 11 operating system, which totals $22.6 million of the 2023 budget

2 for technology licenses.

3

4 Q. PLEASE PROVIDE MORE INFORMATION ABOUT THE MICROSOFT WINDOWS

5 UPGRADE.

6 A. This operating system upgrade will be similar to our Microsoft Next Generation

7 project that upgraded Windows 7 to Windows 10 that I previously

8 described. There will be significant end user enhancements in the Windows 11

9 operating system and significant work related to application readiness from

10 Windows 10 to Windows 11. During 2023, we will need to secure over 17,000

11 licenses for 5 years to secure our end user experience related to Microsoft

12 Operating Systems, Microsoft Office, and the accompanying collaboration

13 suite, including Microsoft Teams and SharePoint. These licenses also secure

14 the platform with the security suite of Bitlocker, Advanced Threat Protection,

15 and Windows Defender.

16

17   c.   *Annual Refresh Projects*

18 Q. DO YOU ALSO ANTICIPATE UNDERTAKING ANNUAL REFRESHES IN 2023?

19 A. Yes. As discussed earlier in my testimony, we must refresh certain hardware

20 devices on a regular basis to address end-of-life issues, maintain reasonably

21 current technology, and replace systems that fail or break unexpectedly as part

22 of the life cycles of these assets. Our 2023 budget for annual refreshes is set

23 forth in Table 14 below:

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Table 14

2023 Annual Refresh Capital Additions

(Dollars in Millions)

2023 Capital Additions	2023 Total
Annual Network Refresh	$4.8
Annual PC Refresh	2.6
Annual Server Refresh	2.8
Annual Storage Refresh	3.4
Annual Printer Refresh	0.6
NSPM Total	**$14.2**

Q. HOW WERE THE 2023 REFRESH BUDGETS ESTABLISHED?

A. Annual refresh budgets for 2023 are established based on previous years' expenses, to maintain an appropriate refresh plan year over year in order to manage the life cycles of these assets.

d.   Core HR Application

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project will replace the multiple existing core Human Resources (HR) software systems and vendors at Xcel Energy – PeopleSoft, TIME, myHR, Talent Management, Learning Management System, Workforce Planning, and Workforce Analytics – with a single, integrated software solution that will be determined upon finalizing the RFP for the project. These applications comprise the core human resource system, provide payroll, benefits administration, workforce management, experience layer, and job record tracking to employees and retirees of the Company.

1   Q.   WHY IS IT NECESSARY TO REPLACE THESE SYSTEMS AT THIS TIME?

2   A.   From a technology perspective, we are running HR systems that are no longer

3   supported by the vendors. The version of PeopleSoft we are on has not been

4   updated since 2010 and is no longer supported by the vendor, creating risk from

5   a technology and security perspective. Our TIME entry system runs on the

6   mainframe, which is targeted to be retired in 2023-2024. The TIME application,

7   PeopleSoft, and internal HR processes are tightly integrated and not replacing

8   each of them within the same program will increase risk and costs to the

9   initiative.

10

11 Q.   ARE THERE ADDITIONAL REASONS FOR COMPLETING THIS PROJECT?

12 A.   Yes. Xcel Energy is required to maintain compliance with federal, state, local,

13   and industry regulations through reporting, audits, and process controls.

14   Selection of an integrated HR solution will provide Xcel Energy with the ability

15   to process and analyze integrated workforce information from a single source.

16   This will optimize data-driven workforce decisions and better support

17   workforce planning to meet Company objectives.

18

19   The integration and modernization of HR systems will also enhance the

20   employee experience through a single personalized interface; provide self-

21   service capabilities that are accessible from a desktop, laptop or mobile device;

22   optimize HR service delivery capabilities; increase and provide more efficient

23   options (chat, chatbots, incident tracking, knowledge base, etc.) for employees

24   to obtain support; and provide capabilities to be more agile in aligning system

25   functionality to evolving business processes. It will also allow us to gain

26   efficiencies in onboarding employees by streamlining processes and eliminating

1   paper forms, and by optimizing workforce decisions to better support

2   workforce planning.

3

4   *e.   Infrastructure Modernization*

5   Q.   PLEASE DESCRIBE THIS PROJECT.

6   A.   As I indicated for 2022, this is a multi-year project that continues with

7   implementations for the 2023 plan year. For this year, the Company continues

8   to implement work having the same project description as 2022.

9

10   *f.   Avaya Cloud License*

11   Q.   PLEASE DESCRIBE THIS PROJECT.

12   A.   This project encompasses a refresh of the Avaya Cloud license. The Avaya

13   Cloud Voice Deployment provides voice telephony services at a majority of

14   Xcel Energy's locations, including corporate offices, service centers, and

15   generation plants. This project upgrades theVoice-over-IP technology that is

16   resiliently hosted within the public cloud. The upgrade will modernize and

17   improve telephone services by upgrading communications features that will

18   allow for better collaboration among employees.

19

20   *g.   Prairie Island Plant Process Computer System Upgrade*

21   Q.   PLEASE DESCRIBE THIS PROJECT.

22   A.   The Plant Process Computer System (PPCS) is a critical system for both

23   operations and emergency preparedness at the Company's nuclear facilities.

24   The PPCS performs regulatory-required safety functions and supports plant

25   monitoring and is needed to maintain full power operation. The PPCS provides

26   plant data to the OSI PI systems for monitoring and diagnostics and thereby

27   reduces plant maintenance costs and improves equipment reliability.   This

1   project work, at the Prairie Island Nuclear Generating Station, will involve

2   hardware and software upgrades for the PPCS. These hardware and software

3   components typically have a lifespan of 7-8 years based on their lifecycles, which

4   must be upgraded when approaching end-of-life or are no longer supported by

5   the vendor. Without upgrading these components of the PPCS, the Company

6   will not be able to adequately maintain the system in order to meet cyber security

7   compliance requirements and plant operational risks would increase.

8

9   *h.   WAN NSPMN*

10   Q.   PLEASE DESCRIBE THIS PROJECT.

11   A.   Discussed above with respect to 2022 investments, this project continues the

12   detail design, planning, installation and commissioning of equipment that

13   comprises an expansion and privatization of the Company's corporate WAN

14   across our service territories, as discussed earlier in my testimony. The portion

15   of this ongoing project that will be in service in 2023 includes deploying routers,

16   switches, firewalls and wireless infrastructure. It also includes services for the

17   design and implementation of these systems.

18

19   *i.   Prairie Island Security Computer System*

20   Q.   PLEASE DESCRIBE THIS PROJECT.

21   A.   The Prairie Island Nuclear Generating Station's Security Computer System

22   (SCS) provides important physical security for this nuclear facility. The SCS

23   performs many security functions related to access, issue warnings, and security

24   communications. The existing SCS was installed in 2014. In order to remain

25   in compliance with federal Regulatory Cyber Security requirements, the SCS will

26   need to be upgraded. The lifespan for servers, workstations, network switches,

27   and other systems are generally 7-8 years depending on the system. Hardware

1   and software SCS components that are at end-of-life or are no longer supported

2   by the vendor need to be replaced under this project. Hardware and software

3   that is near end-of-life or no longer supported by the vendor risk higher rates

4   of failure.

5

6   *j.*   *Transform Operational Reporting*

7   Q.   PLEASE DESCRIBE THIS PROJECT.

8   A.   This project will move operational reporting functions at the Company's nuclear

9   generation plants into an SAP business operational reporting platform, the SAP

10   BusinessObjects Business Intelligence suite. Traditionally, the Company has

11   utilized various kinds of documents, such as spreadsheets, to carry out

12   operational reporting, which has become insufficient to adequately report data

13   and report trends in order to provide actionable insights. Moving to a SAP

14   operational reporting platform will help the Company track operational

15   progress, improve productivity, and adjust to trends rapidly. This will also lead

16   to cost efficiencies and reductions. Upgrading operational reporting software

17   will enable employees to view dashboards for the most important, high-level

18   information first, and would enable more detailed reporting of operational data

19   that would lead to actionable insights and improvements. Upgrading to a SAP

20   business operational reporting platform will also consolidate reporting tools

21   with the enterprise overall, and create synergies and consistencies with

22   Company business practices and allow for more efficient toolset usage.

23

24   *k.*   *SAS BookRunner Upgrade*

25 Q.   PLEASE DESCRIBE THIS PROJECT.

26 A.   This project will upgrade the SAS BookRunner Energy Trading Risk

27   Management (ETRM) application, which the vendor is no longer offering, with

1 term license at Xcel Energy. It is a critical application used by the Risk

2 Management area to measure, manage, and report risk for energy trade

3 transactions. SAS communicated in October 2019 that they will retire its

4 product "Book Runner." This project is to implement a new solution that will

5 provide Risk Management with the continued capabilities necessary to support

6 the Commercial Operations to optimize risk management for Xcel Energy's

7 trade model.

8

9   *l.* *2023 Oracle License*

10 Q. PLEASE DESCRIBE THIS PROJECT.

11 A. For 2023, like 2022, this licensing work relates to the Company's upgrade of the

12 Oracle database across the Xcel Energy enterprise as the current version of the

13 Oracle database was at end of life and no longer supported by Oracle. Xcel

14 Energy renegotiated its Oracle Perpetual Unlimited License Agreement (PULA)

15 in 2021, which will lock in licensing pricing for five years and will ensure

16 licensing requirements compliance with Oracle. The Oracle database supports

17 many Xcel Energy critical systems.

18

19   *m.* *Rugged Tablets Refresh*

20 Q. PLEASE DESCRIBE THIS PROJECT.

21 A. This is a refresh project that continues from 2022 with implementations for

22 2023. As noted above, these "rugged" tablets, or MDTs, are generally used by

23 Xcel Energy employees in the field in the critical areas of Distribution,

24 Construction, Transportation, Emergency, and Trouble, in both the electric and

25 gas jurisdictions.

1		*n.* *VoIP Refresh*
2	Q.	PLEASE DESCRIBE THIS PROJECT.
3	A.	As in 2022, this refresh project in 2023 represents both replacing legacy
4		communications systems and upgrading to more modern VoIP communication
5		systems. This project will upgrade Company technologies for the delivery of
6		voice communications and multimedia sessions over the Internet.
7		
8		*o.* *DR Technology Refresh*
9	Q.	PLEASE DESCRIBE THIS PROJECT.
10	A.	This project will replace aging DR hardware for VMware, Linux, and Windows
11		environments. This technology refresh will enable the Company to proactively
12		test and implement a new methodology of the DR environment. This project
13		will provide engineering, infrastructure, and software to ensure that the
14		Company will be fully prepared during a disaster. As I previously discussed,
15		this is a multi-year project with various components that will be placed in service
16		as assets are deployed.
17		
18		*p.* *Facility IT Investments*
19	Q.	PLEASE DESCRIBE THIS PROJECT.
20	A.	This work continues with capital additions for 2023. As I explained for 2022,
21		new service centers or offices are built as needed to support growing or
22		expanding communities. Facility IT investments represent the necessary IT
23		network infrastructure needed to connect these sites. This includes the
24		construction of main distribution frames, intermediate distribution frames,
25		cabling to connect workstations and phones, deployment of wireless access
26		points, and the installation of any routers, switches and/or firewalls to secure
27		the site.

1   *2.   Cyber Security*

2 Q. ARE ANY CAPITAL PROJECTS TO ADDRESS EVOLVING CYBER SECURITY THREATS

3   AND REQUIREMENTS INCLUDED IN THE 2023 PLAN YEAR?

4 A. Yes. Our in-service cyber security investments for 2023 are expected to total

5      $13.2 million, as set forth in Table 15 below. I discuss the projects that comprise

6   the majority of the 2023 cyber security capital additions in the following

7   testimony.

8

9   **Table 15**

10   **2023 Cyber Security Capital Additions**

11   **(Dollars in Millions)**

2023 Capital Additions	2023 Total
IT –Security Technology Refresh	$11.1
OT Shared Services	1.4
Cyber Security (small investment)	.7
NSPM Total	**$13.2**

16 *There may be differences between the sum of the individual category amounts and Total
amounts due to rounding.

17

18 Q. WHAT IS THE IT SECURITY TECHNOLOGY REFRESH?

19 A. The Security Technology Refresh is the primary Cyber Security project that will

20   be put into service in 2023. While we call this a "refresh," it is an update of

21   security technology rather than a routine annual refresh like those described

22   above for aging technologies. The scope of this project is to update critical

23   cyber security technology including perimeter security, internal infrastructure

24   security, application security, and to implement vulnerability management to

25   protect sensitive customer and business information. It is imperative to keep

26   our technology up to date to ensure continued compliance with regulatory

27   requirements (as for customer data) and overall corporate security objectives

1   while reducing our business's and our customers' exposure to evolving cyber

2   security risks and vulnerabilities. This work will be placed in service as the

3   individual pieces of technology become ready for use. This project is in the

4   initial stages of planning, with cost and schedule estimates based on internal

5   experience with similar implementations. We will follow a competitive bid

6   process to ensure that costs remain in-line with the approved budget that Xcel

7   Energy receives quality service at a fair price, and that business value is delivered

8   per the agreed requirements.

9

10 Q. WHAT IS THE OT SHARED SERVICES PROJECT?

11 A. This project continues from the 2022 test year with capital additions for 2023.

12   As I stated above, this project consists of investments in the operational

13   technology environment that are needed to support AGIS and operations

14   applications, such as substation, synchrophasor, and the DEMS. This project

15   will reduce operational technology and regulatory business risks for enterprise

16   strategic initiatives while providing value by supporting this environment with

17   shared services.

18

19   *3.   Enhancing Capabilities*

20 Q. ARE ANY CAPITAL PROJECTS TO ENHANCE COMPANY CAPABILITIES INCLUDED

21   IN THE 2023 PLAN YEAR?

22 A. Yes. Our investments to enhance capabilities and be placed in service in 2023

23   are expected to total $56.0 million as depicted below in Table 16. I discuss the

24   projects that comprise the majority of the 2023 enhancing capabilities capital

25   additions in the following testimony. For 2023, the Company is investing

26   significantly in its fiber optics network, which I describe below and which will

27   provide enhancements through substantial network growth.

Table 16

2023 Enhancing Capabilities Capital Additions

(Dollars in Millions)

2023 Capital Additions	2023 Total
Strategic Fiber Deployment	$23.3
Nuclear APM Phase 2 - Plant Integration	7.7
Nuclear Online Work Management (OWM)	4.7
EXT Mobile Application Development	4.6
Meter-to-Receipt Resiliency Phase II	3.6
SAP Continuous Improvements	2.3
NSPM Microwave	2.1
Distribution Scheduling Phase II	1.6
ServiceNow Enhancements	1.1
APM Phase 3	1.1
Enhancing Capabilities (small investments)	4.0
NSPM Total	**$56.0**

*There may be differences between the sum of the individual category
amounts and Total amounts due to rounding.

Q. WHAT IS THE STRATEGIC FIBER DEPLOYMENT PROJECT?

A. Under this project, the Company will acquire dark fiber optic cable assets in order to support enterprise network connectivity. Acquiring dark fiber allows for more control over technology resiliency, capacity, and architecture. The high availability design of the network makes use of diversity in a couple ways: fiber cabling enters the buildings via two physically separate entrances; and buildings have two fibers available to carry traffic, allowing for one fiber to be cut without an impact to the operation. The Strategic Fiber network design is based on a dual entrance topology solution that will use existing and new dark fiber optic cables in order to maintain operational business partner requirements

1   related to latency (speed of transmission), availability and bandwidth for

2   transmission of information through cables.

3

4   Q. HOW WILL THE COMPANY IMPLEMENT THIS PROJECT?

5   A. The Company will procure and extend dark fiber optic cables to certain sites in

6   the metropolitan Minneapolis-St. Paul area. These sites were identified as

7   having high monthly recurring costs typically due to the lack of connectivity

8   options at these locations coupled with the importance of these locations in

9   Xcel Energy's operations, mandating their perpetual and expensive usage. The

10   project will allow for substantial network growth due to the fiber lines being

11   wholly dedicated to Xcel Energy's usage and are therefore not as dependent

12   upon usage as leased/shared circuits. Another benefit of the Strategic Fiber

13   Deployment project is to provide high speed access to various entities that Xcel

14   Energy has relationships with, like public cloud providers such as Amazon Web

15   Services, Microsoft Azure, Google GCP and various network partners like

16   CenturyLink and Verizon.

17

18 Q. WHAT IS THE NUCLEAR APM PHASE 2 – PLANT INTEGRATION PROJECT?

19 A. This Phase 2 work implements various modules in the GE Asset Performance

20   Management (APM) software, which is a suite of software products that helps

21   the Company optimize asset performance and increase O&M efficiency across

22   nuclear generation fleet assets. Xcel Energy worked with the vendor, GE, to

23   plan and roadmap during the Phase 1 portion of the project on a staggered

24   implementation of modules based on the highest business priorities under the

25   health, strategy, reliability, and integrity pillars of the APM suite. The benefits

26   of the Phase 2 implementation of APM software will be to bring data and

27   decisionmaking for equipment reliability into one system and process to be

1   implemented as a fleet, to improve power plant reliability, to increase the value

2   of data and to coalate data from various sources for equipment health and

3   operational processes, and to integrate work orders (through SAP business

4   processes management software), operational data (OSI PI), and other

5   QIM/MOC information related to inspections and asset criticality and health

6   data in order to generate work notifications and QIM (quality issue

7   management) issues automatically. The project will also provide value by

8   reducing labor resource requirements across engineering and operations

9   orginzations, implementing a proactive maintenance strategy to help prevent

10   unplanned outages, lowering work package preparation and maintenance labor

11   costs, automating equipment related regulatory reports, and by supporting the

12   nuclear organization's continued focus on reducing O&M costs by optimizatng

13   asset expenditures and personnel productivity.

14

15   Q.   WHAT IS THE NUCLEAR ONLINE WORK MANAGEMENT (OWM) PROJECT?

16   A.   OWM is a workflow product that uses artificial intelligence, advanced analytics,

17   and frontline feedback that enables the Planning and Scheduling team to better

18   prioritize, plan, and schedule maintenance work at our nuclear facilities. The

19   project will provide dashboards and mobile application links to work

20   management with SAP.

21

22   Q.   WHAT IS THE EXT MOBILE APPLICATION DEVELOPMENT PROJECT?

23   A.   This project continues from 2022 with implementation of components in

24   2023.The budget dollars for 2023 (and in 2024) will fund ongoing enhancements

25   to the field employee mobile apps as well as new capabilities and apps for other

26   employees. The budget allocation level is set to allow three to five new projects

27   to be delivered per year. One example of a new project underway is leveraging

1		smartphone capabilities to scan a Quick Response (QR) Code on an asset—like
2		a transformer, breaker, or pole—to instantly have all the information about the
3		equipment at their fingertips. Prioritized ideas go through formal business case
4		analysis and funding approval prior to being selected to move into development.
5		
6	Q.	WHAT IS THE METER-TO-RECEIPT RESILIENCY PHASE II PROJECT?
7	A.	This project will enhance and streamline daily processing performance and
8		billing invoice generation across Xcel Energy as more complex rates and riders
9		are implemented to provide additional options and services for our customers.
10		The project will also include updated architectural components that ensure the
11		application remains supported, resilient, and secure.
12		
13	Q.	WHAT IS THE SAP CONTINUOUS IMPROVEMENTS PROJECT?
14	A.	SAP is an enterprise application and continuous improvement is needed to
15		continue fully utilizing and obtaining the benefits of having an enterprise
16		application. These improvements are intended to address such issues as
17		implementing security patches and upgrades, and utilizing additional technology
18		capabilities. This is a multi-year project, with various components placed in
19		service as assets are deployed, which continue to 2024 as referenced below.
20		
21	Q.	WHAT IS THE NSPM MICROWAVE PROJECT?
22	A.	This project will upgrade the radio and antenna components of the microwave
23		communications equipment in the NSP-Minnesota region, along with
24		converting time-division multiplexing (TDM) to Ethernet packets. The radio
25		communication equipment in Minnesota has reached the end of its useful life
26		cycle and upgrading the equipment will improving resiliency and stabilization
27		for the Company's microwave communications equipment.

1   Q.   WHAT IS THE DISTRIBUTION SCHEDULING PHASE 2 PROJECT?

2   A.   This work is the second phase of a Company initiative that will automate

3   scheduling processes in the Distribution area and will provide efficiencies and

4   enhance the value that Company employees provide to customers. This project

5   will partner with the newly formed Digital Operations Factory, and will deliver

6   a secure multi-tenant cloud platform as a foundational engine for each of the

7   allowing for resuable data, integrations of data, benchmarking, use with mobile

8   platforms and artificial intelligence. Currently distribution is augmented with

9   outlook for a primary scheduling tool. The Distribution Scheduling Phase 2

10   project will allow for dependancies of multiple crews, availability of crews and

11   materials, and allow for prioritization of work.

12

13 Q.   WHAT ARE THE SERVICENOW ENHANCEMENTS?

14 A.   ServiceNow is a project the Company placed into service in 2021 that will help

15   provide better customer service by improving the Company's ability to route

16   information more effectively through its system, and will provide analytical

17   support in identifying, managing, and fulfilling service incidents or concerns

18   that customers bring to the Company. The project will also help track

19   performance in these areas, in an effort to continually improve in these areas.

20   The ServiceNow Enhancements project will build off of the initial

21   implementation by delivering new modules such as expanding application

22   management, network automation, and mapping of towers

23

24 Q.   WHAT IS THE APM PHASE 3 PROJECT?

25 A.   The APM Phase 3 project moves various Digital Operations Factory and APM

26   software components. to run on external cloud storage. Moving APM to the

27   cloud aligns with GE's long-term project lifecycle model, allows for more

1   advanced analytics around asset health, and allows for automatic software

2   updates.

3

4   *4.   Customer Experience*

5   Q.   ARE ANY CAPITAL PROJECTS TO ENHANCE THE CUSTOMER EXPERIENCE

6   INCLUDED IN THE 2023 PLAN YEAR?

7   A.   Yes. We anticipate additional investments in 2023 for the customer experience

8   effort that will total $1.2 million. The 2023 capital additions for these projects

9   are set forth in Table 17 below:

10

11   **Table 17**

12   **2023 Customer Experience Capital Additions**

13   **(Dollars in Millions)**

2023 Capital Additions	2023 Total
CXT Budget	$1.2
NSPM Total	**$1.2**

17

18   Q.   COULD YOU DESCRIBE THE CAPITAL ADDITIONS FOR 2023 FOR THE CUSTOMER

19   CATEGORY IN MORE DETAIL?

20   A.   Yes. For 2023, the Company continues to implement components to the CXT

21   program that will provide additional experiences for our customers and will

22   have defined outcomes as I described for 2022 work.

1   *5.   Emergent Demand*

2   Q.   DOES BUSINESS SYSTEMS INCLUDE EMERGENT DEMAND IN ITS 2023 BUDGET,

3   AS IT DID FOR 2022?

4   A.   Yes, our 2023 budget for Emergent Demand includes $4.4 million allocated to

5   NSPM.

6

7   Q.   HOW DID THE COMPANY ESTABLISH THE EMERGENT DEMAND BUDGET FOR

8   2023?

9   A.   The current budget is based on business priorities for the year, balanced by the

10   overall business area capital spending guidelines. In other words, the Emergent

11   Demand budget reflects the need to ensure adequate funds for emerging

12   technology needs – whether emerging new projects or enhancements to

13   currently planned projects. IT projects funded by Emergent Demand will be

14   approved through our TIG process I identified above, in accordance with our

15   budget process.

16

17   Q.   IS THE 2023 EMERGENT DEMAND BUDGET SIMILAR TO THE 2022 BUDGET?

18   A.   Not particularly. In 2023, the Company is forecasting such a high demand for

19   IT solutions that we have left a small portion of the total Business Systems

20   budget in Emergent Demand to allow for full vetting of the sheer number and

21   scope of project needs.   The individual Aging Technology, Customer

22   Experience, Cyber Security, and Enhancing Capabilities projects that are

23   identified in my testimony for 2023 and 2024 are those that have been approved

24   and often require more advance planning; in addition to these, we will need at

25   least the remaining Emergent Demand funds to meet a reasonable number of

26   employee and customer needs in 2023 and beyond.

1   Q.   WHAT ARE THE BENEFITS OF BUDGETING FOR EMERGENT DEMAND?

2   A.   In addition to being available to undertake emerging projects as I describe

3   above, Emergent Demand allows us to more comprehensively vet requested

4   changes in individual project scope. Before a project team can access Emergent

5   Demand funds, a project must again be reviewed and approved under the TIG

6   process.

7

8   Q.   CAN YOU EXPLAIN IN MORE DETAIL HOW REQUESTS FOR FUNDING FROM

9   EMERGENT DEMAND ARE REVIEWED?

10   A.   Yes. Requests for funds from Emergent Demand, including any request that

11   may arise for a new project or for more funding on an existing project, are

12   reviewed to ensure need. Emergent Demand therefore provides another layer

13   of governance for existing projects, because they must receive an additional

14   round of approval before being allocated funds from Emergent Demand.

15

16   Q.   IS THE BUSINESS SYSTEMS BUDGET HIGHER THAN PREVIOUS YEARS BECAUSE OF

17   EMERGENT DEMAND?

18   A.   No. The 2022-2024 budget level was initially established by reviewing the

19   capital plan and then creating an Emergent Demand funding level for each

20   budget year based on business priorities, balanced by the overall business area

21   capital spending guidelines. We continue to refine the Emergent Demand

22   budget with each new budgeting cycle, removing dollars from this capital

23   budget grouping and assigning them to projects that have become more definite

24   in scope and planning. In sum, we are ensuring our budgets are managed

25   carefully and are reasonable in the face of significant increasing demand.

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1   **F.   2024 Capital Additions**

2   Q.   WHAT CAPITAL ADDITIONS IS BUSINESS SYSTEMS PROPOSING TO MAKE IN 2024?

3   A.   The $89.2 million. This capital additions budget includes a number of projects

4   that are categorized below in Table 18 according to the capital budget groupings

5   described earlier in my testimony.

6

7   **Table 18**

8   **2024 Capital Additions**

9   **(Dollars in Millions)**

2024 Categories	2024 Total
Aging Technology	$42.6
Cyber Security	15.6
Enhance Capabilities	17.9
Customer	0.4
Emergent Demand	12.8
NSPM Total	**$89.2**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

17

18   *1.   Aging Technology*

19 Q.   ARE ANY CAPITAL PROJECTS TO REPLACE AGING TECHNOLOGY INCLUDED IN

20   THE 2024 PLAN YEAR?

21 A.   Yes. We anticipate that investments in aging technology for 2024 will total

22       $42.6 million, as depicted below in Table 19. I discuss the projects that

23   comprise the majority of the 2024 aging technologies capital additions in the

24   following testimony. In addition, refreshes are ongoing as illustrated in Table

25   19 and are discussed in greater detail below.

Table 19

2024 Aging Technology Capital Additions

(Dollars in Millions)

2024 Capital Additions	2024 Total
Annual Refresh	$16.1
Infrastructure Modernization	7.5
Enterprise Project Portfolio Management	7.2
WAN NSPMN	5.0
Technology License	2.6
VoIP Refresh	1.0
DR Technology Refresh	1.0
Aging Technology (small investments)	2.1
NSPM Total	**$42.6**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

   a. *Annual Refresh Projects*

Q. DO YOU ALSO ANTICIPATE UNDERTAKING REFRESHES IN 2024?

A. Yes. As discussed above, we must refresh certain hardware devices on a regular basis to address end-of-life issues, maintain reasonably current technology, and replace systems that fail or break unexpectedly. Our 2024 budget for annual refreshes is set forth in Table 20 below:

	1	**Table 20**

	2	**2024 Annual Refresh Capital Additions**

	3	**(Dollars in Millions)**

2024 Capital Additions	2024 Total
Annual Network Refresh	$5.2
Annual PC Refresh	3.1
Annual Server Refresh	3.4
Annual Storage Refresh	3.9
Annual Printer Refresh	0.6
NSPM Total	**$16.1**

b.   *Infrastructure Modernization*

Q.   PLEASE DESCRIBE THIS PROJECT.

A.   This multi-year project continues with implementations for the 2024 plan year. For this year, the Company continues to implement incremental work having the same project description as previous years.

c.   *Enterprise Project Portfolio Management*

Q.   PLEASE DESCRIBE THIS PROJECT.

A.   This project will implement a new Project Portfolio Management (PPM) tool across Xcel Energy that will replace various PPMs used among business units to create a unified PPM tool across units that can be timely upgraded to ensure vendor support. PPMs currently used are either at end-of-life, out of vendor support, or have insufficient structured support. A new, unified PPM tool will help the Company in portfolio building and optimization as well as tracking project executions.

1   *d.   WAN NSPMN*

2   Q.   PLEASE DESCRIBE THIS PROJECT.

3   A.   This multi-year project continues the detail design, planning, installation and

4   commissioning of equipment that comprises an expansion and privatization of

5   the Company's corporate WAN across our service territories, as discussed

6   earlier in my testimony. The portion of this ongoing project that will be in

7   service in 2024 continues to include deploying routers, switches, firewalls and

8   wireless infrastructure. It also includes services for the design and

9   implementation of these systems.

10

11   *e.   Technology License 2024*

12   Q.   PLEASE DESCRIBE THIS PROJECT.

13   A.   This project provides software license support across enterprise infrastructure

14   and operations for the 2024 test year. This is similar to the annual technology

15   license work I addressed for 2022 and 2023 aside from the Microsoft Windows

16   11 upgrade work.

17

18   *f.   VoIP Refresh*

19   Q.   PLEASE DESCRIBE THIS PROJECT.

20   A.   As I described earlier for 2022 and 2023, this project represents both replacing

21   legacy communications systems and upgrading to more modern VoIP

22   communication systems in 2024.

23

24   *g.   DR Technology Refresh*

25   Q.   PLEASE DESCRIBE THIS PROJECT.

26   A.   This project continues from the 2022 and 2023 years with capital additions for

27   2024. The description for this work is the same as I previously described.

1   *2.   Cyber Security*

2   Q.   ARE ANY CAPITAL PROJECTS INTENDED TO ADDRESS EVOLVING CYBER

3   SECURITY THREATS AND REQUIREMENTS INCLUDED IN THE 2024 PLAN YEAR?

4   A.   Yes. Our in-service cyber security investments for 2024 are expected to total

5          $15.6 million, as set forth in Table 21 below. I discuss the projects that comprise

6   the majority of the 2024 cyber security capital additions in the following

7   testimony.

8

9   **Table 21**

10   **2024 Cyber Security Capital Additions**

11   **(Dollars in Millions)**

12

2024 Capital Additions	2024 Total
IT Security Technology Refresh	$13.1
OT Shared Services	1.5
Cyber Security (small investment)	1.0
NSPM Total	**$15.6**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

17

18   Q.   WHAT IS THE IT SECURITY TECHNOLOGY REFRESH?

19   A.   As I stated for 2023, these funds are budgeted for cyber security projects to be

20   placed in service in 2024 that will provide continued refreshes for prevention,

21   detection, containment, and corrective services to protect the Company from

22   security incidents, and assist in the recovery from any adverse events.

23

24   Q.   WHAT IS THE OT SHARED SERVICES PROJECT?

25   A.   This project continues from the 2022 and 2023 years with capital additions for

26   2024. The description for this work is the same as I previously described.

1   *3.   Enhancing Capabilities*

2   Q.   ARE ANY CAPITAL PROJECTS TO ENHANCE COMPANY CAPABILITIES INCLUDED

3   IN THE 2024 PLAN YEAR?

4   A.   Yes. Our investments to enhance capabilities for 2024 are expected to total

5          $17.9 million, as depicted below in Table 22. I discuss the projects that

6   comprise the majority of the 2024 enhancing capabilities capital additions in the

7   following testimony.

8

9   **Table 22**

10   **2024 Enhancing Capabilities Capital Additions**

11   **(Dollars in Millions)**

12

2024 Capital Additions	2024 Total
EXT Mobile Application Development	$4.6
APM Phase 2 (Fossil)	2.7
HCM LMS Analytics and Automation	2.5
Nuclear Asset Management and Maintenance	1.7
SAP Continuous Improvements Placeholder	1.4
Enhancing Capabilities (small investments)	5.0
NSPM Total	**$17.9**

19   *There may be differences between the sum of the individual category
            amounts and Total amounts due to rounding.

20

21

22   Q.   WHAT IS THE EXT MOBILE APPLICATION DEVELOPMENT PROJECT?

23   A.   This project continues from 2022 and 2023 with implementation of

24   components in 2024.   Budgeted dollars for 2024 will fund ongoing

25   enhancements to the field employee mobile apps as well as new capabilities and

26   apps for other employees, that will enable more effective delivery of service for

27   customers.

1   Q.   WHAT IS THE APM PHASE 2 (FOSSIL) PROJECT?

2   A.   This project will employ foundational components of APM (asset performance

3   management software) analytic applications and capabilities, which in this Phase

4   2 will provide increased visibility into asset health, data quality, failure history,

5   metrics, and operational risk that will enable better decisionmaking to optimize

6   and costs, reliability, and asset risks at our coal and natural gas generation plants.

7   This project will enhance the Company's capabilities in multiple ways at its

8   generation plants. This will drive better decisionmaking through user-specific

9   dashboards and unified data views that will provide operational insights and

10   drive business outcomes. This project will enable operational excellence by

11   providing tools to perform the right maintenance at the right time and on the

12   right assets. It will also increase reliability and availability of these assets, while

13   minimizing costs and reducing operational risks. The project will also facilitate

14   resource savings through reduction in manual data consolidations, review, and

15   analysis from various data sources. In addition, it will alow continuous, real

16   time analysis and visibility to understand options for mitigating anticipated

17   problems while balancing costs, risks, and benefits, while reducing reactive

18   maintenance and overtime costs.

19

20   Q.   WHAT IS THE HCM LMS ANALYTICS AND AUTOMATION PROJECT?

21   A.   This Human Capital Management (HCM) Learning Management System (LMS)

22   project will enhance the learning experience for our employees and contractors

23   and extend the capability of the LMS, including the integration of data back to

24   the learning application or related data warehouse for improved reporting,

25   virtual learning, visual mapping, learning content management and integrate

26   with the HCM project. In addition, the new application will allow for a more

1   robust tracking of learning history for employees or contractors for compliance

2   purposes.

3

4 Q. WHAT IS THE NUCLEAR ASSET MANAGEMENT AND MAINTENANCE PROJECT?

5 A. This project leverages integrated sensor data to conduct advanced analytics that

6   will support the Company's nuclear generation operations. This work will be a

7   data-driven system that will enhance system health and equipment reliability.

8

9 Q. WHAT IS THE SAP CONTINUOUS IMPROVEMENTS PROJECT?

10 A. For this project that continues into 2024, SAP enterprise application

11   improvements continue to be prioritized and implemented in order to fully

12   utilize and obtain the benefits of having an enterprise application.

13

14   *4.   Customer Experience*

15 Q. ARE ANY CAPITAL PROJECTS TO ENHANCE THE CUSTOMER EXPERIENCE

16   INCLUDED IN THE 2024 PLAN YEAR?

17 A. Yes. For 2024, the Company contiunues to implement components to the CXT

18   program.   These implementations will bring components with defined

19   outcomes and enhancements that will build on the CXT platform. Our current

20   budget includes smaller 2024 investments in the customer experience of $0.4

21   million.   However, the Company continues to examine CXT needs, and

22   anticipates continuing investment in the customer experience in the years ahead.

1		5. *Emergent Demand*
2	Q.	DOES BUSINESS SYSTEMS INCLUDE EMERGENT DEMAND IN ITS 2024 BUDGET,
3		AS IT DID FOR 2022 AND 2023?
4	A.	Yes, although the dollar amounts are not the same given the different IT needs
5		of our Company in different years. The MYRP 2024 Emergent Demand budget
6		includes $12.8 million based on forecasted business priorities for the year,
7		balanced by the overall business area capital spending guidelines. We have not
8		yet distributed funding from 2024 Emergent Demand to the specific budget
9		categories where it may be spent.
10		
11	Q.	WHAT DO YOU CONCLUDE WITH RESPECT TO THE OVERALL LEVEL OF BUSINESS
12		SYSTEMS CAPITAL COSTS THE COMPANY IS SEEKING TO RECOVER IN THIS RATE
13		CASE?
14	A.	The overall level of Business Systems costs is reasonable, as shown by the above
15		discussion, and is necessary to support an appropriate level of service to our
16		customers. Finally, the costs included in our 2022 through 2024 capital budgets
17		are representative of the types of work we must do year over year.
18		
19		**IV. O&M BUDGET**
20		
21		**A. O&M Overview**
22	Q.	WHAT IS INCLUDED IN THE BUSINESS SYSTEMS O&M BUDGET?
23	A.	The Business Systems O&M budget consists of costs related to the operation
24		and maintenance of existing IT assets such as software systems, computers,
25		printers, phones, radio systems, and servers. It also includes annual software
26		contract and license fees, as well as maintenance agreements, for existing
27		software and hardware. In addition, the O&M budget includes non-capitalized

1   costs associated with developing, enhancing, and maintaining new or existing

2   IT systems.

3

4   Q. WHAT ARE THE OVERALL TRENDS FOR BUSINESS SYSTEMS' O&M EXPENSES?

5   A. Beginning in 2012, as we entered a new phase of capital investment, our costs

6   began to increase – largely because new IT capital investments typically require

7   additional licensing fees, other operational costs, and more complex

8   maintenance. This was reflected in our 2016-2019 MYRP request. From 2018

9   through 2020, Business Systems O&M costs increased largely due to our need

10   to maintain new GL and WAM assets while also maintaining prior IT capital

11   investments. Looking ahead to 2022 through 2024, we anticipate continued

12   cost increases reflecting the addition of new capital investments, customer

13   experience projects, and AGIS investments.

14

15 Q. HOW DO YOU RECONCILE THESE HIGHER BUDGETS WITH THE NEED TO ENSURE

16   CUSTOMER VALUE FOR COMPANY INVESTMENTS?

17 A. These investments benefit our customers in several respects. First, our

18   customers have benefited from lower O&M and capital costs in previous years

19   where we deferred and avoided technology investments by harvesting

20   maximum value from our current systems. However, as previously discussed,

21   we cannot defer investments to replace dated technology or old hardware

22   indefinitely and need to make investments to continue to serve our customers

23   and to protect them and our business from cyber security and system failure

24   risk. Second, our investments in technology help other business areas serve

25   customers efficiently and effectively. Finally, our investments are intended to

26   maintain and enhance our service to customers, including in the ways customers

1   interact with Xcel Energy. Without making these investments, we could not

2   provide reliable, quality service to our customers.

3

4   Q.   WHAT IS THE COMPANY'S BUSINESS SYSTEM'S O&M BUDGET FOR THE 2022 TO

5   2024 MYRP?

6   A.   The total Business Systems O&M budget for the 2022 test year is $103.2 million,

7   for the 2023 plan year is $110.3 million, and for the 2024 plan year is $119.1

8   million (exclusive of AGIS). The basis for this budget is set forth in detail

9   below, utilizing essentially the same categories of O&M utilized in our prior rate

10   cases. I present the Business Systems O&M budget on an NSPM Electric basis.

11

12   Q.   WHAT ARE THE BASIC CATEGORIES OF THE O&M BUDGET?

13   A.   The three-year Business Systems O&M budget can be broken down into 12

14   categories: (1) Network Services; (2) Software License and Maintenance; (3)

15   Company Labor; (4) Distributed Systems Services; (5) Application

16   Development and Maintenance; (6) Contract Labor and Consulting; (7) Shared

17   Assets Allocation; (8) Hardware Purchases and Maintenance (including

18   equipment maintenance); (9) Employee Expenses; (10) Mainframe; (11) AGIS;

19   and (12) Other. Like capital costs, however, most of AGIS O&M is not

20   included in base rates. Table 23 below shows the 2022-2024 Business Systems

21   O&M budget by category, in addition to actuals for 2018-2020 and partially in

22   2021:

Table 23

Business Systems 2018-2024 O&M Actual and Budgeted Expenditures

(Dollars in Millions) (NSPM Electric)

Cost Category	2018 Actuals	2019 Actuals	2020 Actuals	2021 Actual/ Forecast	2022 Budget	2023 Budget	2024 Budget
Network Services	$18.1	$16.6	$17.2	$18.1	$20.0	$20.7	$21.0
Software License and Maintenance	24.5	24.9	29.8	35.6	42.8	44.4	45.8
Company Labor	17.2	17.5	19.1	19.6	22.3	23.1	24.2
Distributed Systems Services	2.9	1.7	.5	.5	.6	.6	.7
Application Development and Maintenance	7.8	8.4	9.1	9.2	9.5	9.5	9.6
Contract and Consulting	9.2	7.8	6.7	4.4	5.2	5.1	5.2
Shared Assets	(1.6)	1.8	5.3	(4.9)	(2.8)	1.2	6.9
Hardware Maintenance and Purchase	2.8	2.9	2.7	3.5	3.5	3.5	3.6
Employee Expenses	.7	.8	.4	.2	.5	.5	.6
Mainframe	1.1	1.1	.6	.5	.9	.9	.9
Other	2.8	.8	2.2	.1	.8	.8	.8
AGIS	.0	1.3	2.1	4.9	6.4	15.0	15.5
Total	**$85.7**	**$85.7**	**$95.6**	**$91.6**	**$109.6**	**$125.4**	**$134.6**
Total Excluding AGIS	**$85.6**	**$84.4**	**$93.5**	**$86.7**	**$103.2**	**$110.3**	**$119.1**

Any differences between sum of individual category amounts and Total are due to rounding.
* The shared asset credit related to AGIS AMI head-end software is reflected in the Shared Asset Total.
*The AGIS row includes internal labor related to the AGIS program

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1   Q.   WHAT ARE THE MAJOR COST DRIVERS OF THE 2022-2024 BUSINESS SYSTEMS

2   O&M BUDGET?

3   A.   Of the categories listed above, I consider five as primary drivers of our Business

4   Systems budget during the MYRP period: (1) Software License and

5   Maintenance; (2) Company Labor; (3) Shared Assets ; (4) Network Services; and

6   (5) AGIS. However, most AGIS costs are included in the TCR Rider rather

7   than through base rates in this case, as Mr. Halama explains. I describe each of

8   the other budget categories later in my testimony, and explain why network

9   needs, licensing costs, labor costs, and the ongoing security needs to keep our

10   software maintenance up to date is increasing in the Company's business-as-

11   usual IT costs.

12

13   Q.   HOW DOES THE 2022-2024 BUDGET TREND OVER THE MYRP?

14   A.   Excluding AGIS and Shared Assets (which consists primarily of the shared asset

15   credit for the Advanced Metering Infrastructure (AMI) head-end software), the

16   2022 budget is 19 percent higher than the 2021 actuals/forecast; 2023 costs are

17   7 percent higher than the 2022 costs; and 2024 costs are 8 percent higher than

18   2023 costs. The primary drivers of the base O&M increase, particularly from

19   2021 to 2022, are the escalating support costs for new software maintenance,

20   ensuring existing applications have ongoing support as described in the

21   Software License and Maintenance section of my testimony, below, and

22   insourcing efforts, which are partially offset by decreases to Contract Labor and

23   Consulting, Network Services.

24

25   Exhibit___(MOR-1), Schedule 3 also provides a further breakdown of O&M

26   costs.

1 Q. HOW HAS THE COVID-19 PANDEMIC AFFECTED THE BUSINESS SYSTEMS O&M

2   LEVELS FOR 2020-2021 AND FORECASTS FOR 2022 AND BEYOND?

3 A. While the coronavirus pandemic has at times changed how we conduct our

4   business, as discussed earlier in my testimony, it has not materially changed

5   Business Systems' O&M costs for 2020 and so far in 2021. Travel is down, but

6   remains a small portion of our overall budget. Other work continues, and in

7   some cases has increased as Business Systems works to serve employees

8   working from home and in new ways due to the pandemic. Our 2021 budget

9   reflects these limited changes, which are also incorporated into our budgets for

10   the next few years.

11

12   **B.   O&M Budget Process**

13 Q. HOW DOES THE COMPANY SET THE O&M BUDGET FOR THE BUSINESS SYSTEMS

14   BUSINESS UNIT?

15 A. Our O&M budget process is similar to our capital budget process in that both

16   are based on a partnership between corporate management of overall finances

17   and the business needs we identify. Ms. Ostrom explains how the Company

18   establishes business area O&M spending guidelines and budgets based on

19   financing availability, specific needs of business areas, and overall needs of the

20   Company. Overall, we establish a reasonable annual O&M level that allows

21   Business Systems to complete priorities that are important to providing a

22   reasonable level of services to the Company and our customers.

23

24 Q. DOES BUSINESS SYSTEMS EVER NEED TO CHANGE THE USE OF BUDGETED

25   O&M FUNDS DURING THE FINANCIAL YEAR?

26 A. Yes. As mentioned earlier in my testimony, Business Systems adjusts for

27   changing business impacts such as updates in technology, customer

1 expectations, operating priorities of the business units across the Company, and

2 the Company finance area. There are times when O&M funds are shifted within

3 Business Systems during the year, typically to address unplanned requirements.

4

5 Q. HOW DOES THE COMPANY DETERMINE CHANGES IN THE BUSINESS SYSTEMS

6   O&M BUDGET FOR FUTURE YEARS?

7 A. As part of the Company's annual budget process, Business Systems performs a

8   review of existing services and expected new services to determine budget needs

9   for future years. This includes an evaluation of annual contract cost escalators

10   for vendors, annual merit increases, changes in the quantity of services

11   estimated to be consumed, and new services. This information is reviewed and

12   evaluated through the budget process and a budget is established for Business

13   Systems for future years.

14

15 Q   DOES THE COMPANY HAVE A PROCESS FOR MITIGATING DEVIATIONS IN

16   ACTUAL EXPENDITURES COMPARED TO BUDGETED EXPENDITURES?

17 A. Yes.   As I previously described for the capital budget, Business Systems

18   management monitors actual versus budget expenditures for both capital and

19   O&M efforts on a monthly basis. Deviations are evaluated and action plans are

20   developed to mitigate variations in actual to budgeted expenditures. These

21   mitigation plans may either reduce or delay other expenditures to support the

22   overall authorized budget. If authorized budget adjustments are required, they

23   are identified and approved at an appropriate level of management.

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1   **C.   O&M Budget Detail**

2   Q.   WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

3   A.   In this section, I describe in detail the components of Business Systems that

4   make up the O&M budget. I will describe each component, discuss any changes

5   to O&M for that component over the course of the MYRP, and discuss ways

6   that the Company mitigates O&M cost growth for that particular component.

7

8   *1.   Network Services*

9   Q.   WHAT ARE NETWORK SERVICES?

10 A.   This category includes costs related to the maintenance of existing circuits,

11   phones, microwave and radio systems, and other IT network infrastructure

12   assets.   Network activities provide operation and management of the

13   Company's internal and external data transmission requirements.   Network

14   services are budgeted based on a price times a quantity.   These costs are

15   dependent upon Xcel Energy's service usage levels and the number of assets in

16   use. As more IT infrastructure is put in place, network maintenance costs

17   increase.

18

19 Q.   WHAT NETWORK ENHANCEMENTS COST CHANGES ARE YOU ANTICIPATING

20   DURING THE MYRP PERIOD?

21 A.   Network system in 2022-2024 reflects the increased usage of the organization's

22   network to support new applications and demand for greater speed and capacity

23   to support existing systems. These usage and demand needs increase each year,

24   as technology advances, new requirements or capabilities are identified and sites

25   are added. Fortunately, the costs are relatively flat during the MYRP due to

26   various actions taken by the Company, including the insourcing of work

27   previously performed by IBM, terminating that contract, and changing the

1   vendor that manages our network circuits. This has resulted in cost savings

2   realized in O&M that would otherwise be higher.

3

4   Network services also encompass the need to upgrade and replace aging

5   components of the network. For example, the SCADA circuits that have been

6   in place for many years for transmission and distribution purposes are based on

7   analog technology. That technology is now digital and those new digital circuits

8   require maintenance to keep current. Another example is the Company's

9   investment in expanding the wireless network in its offices and service centers

10   to aid productivity. This expansion places new assets in service that must be

11   maintained.

12

13   In addition, our network projects identified in the capital section of my

14   testimony allow for growth and the ability to better control future O&M

15   network costs. We have operated much of our older network equipment

16   without maintenance, opting for a time and material repair strategy as needed

17   and thereby reducing costs.

18

19   Network services costs for the MYRP are $20.0 million in 2022 and increase to

20   $20.7 million in the 2023 budget and to $21.0 million in the 2024 budget.

21

22   *2.   Software License and Maintenance*

23   Q. WHAT IS SOFTWARE LICENSE AND MAINTENANCE?

24   A. This category includes expenses for payments to vendors for license agreements

25   associated with various applications and desktop tools used by the Company to

26   perform services. These payments cover updates, support patches, fixes and

27   technical support.

1   Q.   WHAT SOFTWARE LICENSE AND MAINTENANCE COST CHANGES ARE YOU

2   ANTICIPATING FOR THE 2022-2024 MYRP?

3   A.   There are three major drivers of increase to the 2022-2024 budgets, stemming

4   overall from increasing costs in the industry. First, software costs are driven by

5   net new projects, such as our CXT program, Core HR Application, and other

6   investments.   Second, there are increased licensing costs driven by users,

7   escalators in contracts, and upgrades. Third, maintenance and support must be

8   updated to limit vulnerabilities, with cyber security threats increasing all the

9   time, it's more important than ever to keep software maintenance current and

10   in support. Overall, software license and maintenance costs have increased from

11       $42.8 million in 2022 to $44.4 million in the 2023 budget and to $45.8 million

12   in 2024.

13

14 Q.   PLEASE   DISCUSS   EFFORTS   TO   MINIMIZE   INCREASES   IN   SOFTWARE

15   MAINTENANCE COSTS.

16 A.   There are several efforts used to reduce the growth in this category. First, we

17   evaluate the need for maintenance support on applications that will be replaced.

18   For example, as part of our upgrade of project management software

19   consolididating a common solution across business areas, creating a common

20   scheduling playform across Energy Supply and Distribution.   Second, we

21   evaluate the usage of desktop software to determine if the usage justifies the

22   continued need for a product. For example, if a computer user has not used a

23   software product recently, we redeploy the license to a user who has requested

24   the software, thereby avoiding the need to purchase a new license for that user.

25   Finally, we review contracts with vendors as part of the contract renewal process

26   to reduce costs. For example, we might extend the term of a maintenance

27   agreement in order to receive a larger discount, right-size a contract to align to

1   actual usage, or cancel a contract altogether.

2

3   *3.   Company Labor*

4   Q.   WHAT COMPANY LABOR COSTS ARE INCLUDED IN THE BUSINESS SYSTEMS O&M

5   BUDGET?

6   A.   Our labor costs include the cost associated with all employees in the Business

7   Systems department.

8

9   Q.   WHAT COMPANY LABOR COST CHANGES DO YOU ANTICIPATE FOR THE 2022-

10   2024 MYRP?

11   A.   Labor costs for the MYRP are $22.3 million in 2022 and increase to $23.1

12   million in the 2023 budget and to $24.2 million in the 2024 budget. From 2021

13   to 2022 labor is increasing by $2.7 million. The increases are due to two primary

14   reasons. First, we are hiring to support new applications such as Customer, and

15   were we need expertise in house to support new and existing applications which

16   will be offset in Contract and Consulting. Second, salary and merit pay increases

17   also contributed to the increase in 2022. For the years 2023 and 2024, internal

18   labor increases are largely attributable to increases in salary resulting from

19   earned merit pay increases.

20

21   Q.   PLEASE DISCUSS EFFORTS TO MINIMIZE INCREASES IN COMPANY LABOR COSTS.

22   A.   Company labor costs are based on the employee headcount required to provide

23   IT services to the organization. The employee headcount is managed through

24   a workforce plan process that monitors changes and includes attrition

25   information as well as emergent needs. Changes to employee headcount for

26   replacement related to attrition or for new headcount require assessment of the

27   need for the personnel, the associated risks with not filling the position, and

1		alternative options. This process has worked effectively and assures we have
2		the correct resources in place with the right skills and allows us to manage costs.
3		
4		*4. Distributed Systems Services*
5	Q.	WHAT IS DISTRIBUTED SYSTEMS SERVICES?
6	A.	This category includes expenses related to support and maintenance of servers,
7		data storage, personal computers, printers, and similar components of the
8		overall computing environment.
9		
10	Q.	WHAT DISTRIBUTED SYSTEMS SERVICES COST CHANGES DO YOU ANTICIPATE
11		FOR THE MYRP?
12	A.	Growth in the number of servers is largely driven by growth and by capital
13		projects that were placed in service since the 2016 Minnesota electric rate case,
14		such as the GL, WAM, and others. As the number of servers grows, so does
15		the amount of storage because each new server requires storage to function.
16		Since that time, we had an increase in servers of 3,340, bringing the total to
17		6,080. Overall, distributed systems services costs are $0.6 million in 2022, $0.6
18		million in 2023, and $0.7 million in 2024. These costs are less than 2020 and in
19		previous years due to insourcing of steady state work to Company employees.
20		
21	Q.	PLEASE DISCUSS EFFORTS TO MINIMIZE INCREASES IN DISTRIBUTED SYSTEMS
22		SERVICES COSTS.
23	A.	To reduce cost growth and implement savings in this area, the Company
24		renegotiated server and storage costs as part of a vendor contract renegotiation
25		and has hired internal employees to manage this function, and has implemented
26		data retention rules to curb storage growth. For example, all email is purged
27		after 90 days in a user's inbox. Despite these efforts, however, storage growth

1   increased from 3.75 PB since 2016 to 13.55 PB today, which is a 261 percent

2   increase.

3

4   *5.   Application Development and Maintenance*

5 Q. WHAT IS APPLICATION DEVELOPMENT AND MAINTENANCE (ADM)?

6 A. ADM includes costs of services to develop, enhance, maintain, and consult on

7   new or existing IT software and hardware applications.

8

9 Q. WHAT ADM COST CHANGES DO YOU ANTICIPATE FOR THE MYRP?

10 A. ADM costs have modestly increased over the past several years, due largely to

11   a 2017 contract renegotiation that resulted in lower costs going forward, but

12   offset by added software programs. In addition, we continue to thoroughly

13   evaluate our application portfolio on a regular basis, to limit new development

14   for those applications that will be replaced in the near future. Going forward,

15   ADM costs are budgeted to be relatively flat at $9.5 million in 2022, $9.5 million

16   in 2023, and $9.6 million in 2024.

17

18   *6.   Contract Labor and Consulting*

19 Q. WHAT COSTS ARE INCLUDED IN THE BUDGET AS CONTRACT LABOR AND

20   CONSULTING?

21 A. These costs consist of fees and expenses for professional consultants or

22   knowledge-based experts that are not employees of the Company. This

23   category also includes staff augmentation through staffing agencies.

24

25 Q. WHAT CONTRACT LABOR COST CHANGES DO YOU ANTICIPATE FOR THE MYRP?

26 A. Contract labor costs are expected to remain flat at $5.1-5.2 million annually for

27   2022, 2023, and 2024. Actuals from 2018-2020 are higher than the 2022-2024

1   budgets due primarily to continuing to bring steady state work to Company

2   employees rather than outside vendors, which results in Company labor

3   increases described above but also greater consistency and internal expertise.

4

5   *7.   Shared Asset Allocation*

6   Q.   WHAT IS SHARED ASSET ALLOCATION?

7   A.   This category reflects the allocation of Business Systems costs to or from the

8   NSPM operating company, depending on where the asset was purchased and

9   how an investment will be utilized between Xcel Energy operating companies.

10   The dollars associated with this category are, in a sense, a true-up of costs related

11   to a certain investment by assigning to the appropriate jurisdiction(s). This

12   number fluctuates in part on the basis of the jurisdiction in which an investment

13   is purchased, consistent with our capital asset and cost allocation policies

14   discussed by Mr. Moeller and Mr. Baumgarten. For example, the dollars in this

15   account will decrease when an asset is purchased in NSPM but is also utilized

16   in other operating companies. For years 2022, $(2.8) million, 2023 $1.2 million,

17   and 2024 $6.9 million, a large portion of the NSPM Electric Shared Asset

18   balance relates to head end software for AMI as part of the AGIS initiative;

19   therefore, it is reflected in my tables to give a complete picture of Busines

20   System O&M but is not included in base rates.

21

22   *8.   Hardware Purchases and Maintenance*

23   Q.   WHAT IS INCLUDED IN THE HARDWARE PURCHASES AND MAINTENANCE

24   CATEGORY?

25   A.   Our hardware maintenance costs relate largely to vendor contracts we maintain

26   to support hardware systems. This cost category also includes miscellaneous

27   hardware equipment purchases for materials such as batteries, memory cards,

1   keyboards, headsets, and related technical tools. In 2019, due to the minimal

2   amounts charged to equipment maintenance, that category was remapped to

3   rollup in the hardware purchases and maintenance category.

4

5   Q.   WHAT HARDWARE PURCHASES AND MAINTENANCE COST CHANGES DO YOU

6   ANTICIPATE FOR THE MYRP?

7   A.   Costs for this category are expected to fluctuate based on the work being

8   performed and is budgeted for $3.5 million in 2022, $3.5 million in 2023, and

9         $3.6 million in 2024. The overall costs in this category combined with

10   remapping of equipment maintenance remain flat.

11

12   *9.   Employee Expenses*

13   Q.   WHAT EMPLOYEE EXPENSES ARE INCLUDED IN THE BUSINESS SYSTEMS

14   BUDGET?

15   A.   These costs are primarily related to employee travel, occurring on an as-needed

16   basis.

17

18   Q.   WHAT EMPLOYEE EXPENSE COST CHANGES DO YOU ANTICIPATE FOR THE

19   MYRP?

20   A.   Costs for employee expenses are budgeted at $0.5 million annually for 2022,

21        $0.5 million for 2023, with an increase to $0.6 million in 2024. These amounts

22   reflect additional travel in 2022-2024 as compared to 2020-2021, based on

23   anticipated business needs, but will be lower than in previous years due to the

24   COVID-19 pandemic's impact on budgeting for employee expenses going

25   forward.

1   Q.   PLEASE DISCUSS EFFORTS TO MINIMIZE EMPLOYEE EXPENSES COSTS.

2   A.   We encourage employees to limit expense to the greatest extent possible.

3   Simple efforts help contain costs, such as using technology like video-

4   conferencing as a measure to reduce travel-related employee expenses. Overall,

5   we encourage a conservative approach and limit approval of planned travel

6   accordingly. The pandemic has taught us that videoconferencing technology

7   like Zoom and Microsoft Teams can be used to mitigate certain employee

8   expense costs.

9

10   *10.   Mainframe*

11   Q.   WHAT ARE MAINFRAME COSTS?

12   A.   These are costs for maintaining the centralized applications running on the

13   mainframe computer, which serve multiple business needs such as batch

14   processing for meter reading

15

16   Q.   WHAT MAINFRAME COST CHANGES DO YOU ANTICIPATE FOR THE MYRP?

17   A.   Mainframe costs are expected to remain flat at $0.9 million for 2022, 2023, and

18   2024.

19

20   *11.   AGIS*

21   Q.   WHAT TYPES OF IT O&M COSTS IS BUSINESS SYSTEMS INCURRING TO

22   IMPLEMENT THE AGIS PROJECTS?

23   A.   The types of O&M costs Business Systems is incurring and expects to incur for

24   AGIS include hardware support, costs for the AMI head-end software (which

25   is a shared asset), data storage, annual software maintenance, labor for software

26   support and project oversight, and application support, which includes ongoing

27   testing, review of processes, and application of security patches to respond to

1   evolving threats. As I previously discussed, the Company proposes to recover

2   internal labor costs through base rates, with Company witness Mr. Halama

3   explaining how internal labor costs are calculated for purposes of setting base

4   rates. Other O&M costs for AGIS are not being requested in base rates at this

5   time, as the Company is instead seeking recovery through the TCR Rider. As a

6   result, I identified these other costs in my testimony solely to illustrate more

7   holistically how Business Systems is allocating O&M resources.

8

9   *12.   Other*

10   Q.   WHAT COSTS REMAIN IN THE "OTHER" CATEGORY?

11   A.   This category includes very small purchases for administrative materials, dues,

12   fleet chargeback expenses, and internal building moves.

13

14   Q.   WHAT CHANGES IN "OTHER" DO YOU ANTICIPATE FOR THE MYRP?

15   A.   Costs in this category are $0.8 million in 2022, 2023, and 2024, respectively.

16

17   Q.   WHAT DO YOU CONCLUDE ABOUT BUSINESS SYSTEMS' O&M COSTS OVERALL?

18   A.   We have worked hard in recent years to contain O&M costs, which is reflected

19   in the number of O&M categories with flat expense levels and budgets between

20   past and future years. Where costs are rising, this is due to increased investment

21   in capital, and increased demand for technology services such as network and

22   data support. In turn, these increases in demand are consistent with the overall

23   direction and rising needs for IT services in all types of businesses. As such,

24   our O&M cost levels reflect prudent management and cost containment.

1	**V. CONCLUSION**
2	
3	Q. PLEASE SUMMARIZE YOUR TESTIMONY.
4	A. I recommend that the Commission approve the Business Systems capital and
5	O&M budget presented in this rate case. Our planned capital investments are
6	managed appropriately and established to address aging technology, cyber
7	security, customer experience, enhanced capabilities, and emerging demand for
8	the Company. The budgets we propose are a reasonable representation of the
9	activities we will undertake on behalf of the Company and ultimately our service
10	to customers through 2024 and beyond.
11	
12	Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?
13	A. Yes, it does.

MICHAEL OWEN REMINGTON

414 Nicollet Mall, Minneapolis, MN 55401

PROFESSIONAL EXPERIENCE

Regulatory Director, Business Systems Advanced Grid (February 1 2021 to present)

- Responsible for regulatory filings and related activities in support of Xcel Energy's advanced grid initiative.
- Sworn witness for IT business unit in rate cases, riders, certificates of public convenience and necessity, and other filings across several jurisdictions.

Director, IT Operations, Xcel Energy, Minneapolis, MN (July 2019 to January 31 2021)

- Accountable for IT service management, critical incident management, disaster recovery, enterprise monitoring, and regulatory compliance.
- Led four managers and an organization of 30 employees.
- Team managed 9,000 IT change requests and 140,000 IT service requests per year; 55,000 device monitors in place, 70 support team referrals per day, and over 1,000 incidents per year resolved prior to an outage.
- Sworn witness for Texas and New Mexico rate cases.

Senior Business Manager, Xcel Energy, Minneapolis, MN (July 2008 to June 2019) (interim assignment below)

- Critical incident manager (on-call rotation): Responsible for representing business and customer interests during technology-related outages or situations of elevated risk.
- Led a team responsible for IT service processes (Problem, Change, Request, and Asset Management).
- Led implementation of a single-pane-of-glass service request portal and automated request fulfillment.
- Drafted effective testimony and discovery responses in support of nine public utility rate cases in three jurisdictions.

Attorney and Solutions Consultant, Xcel Energy, Minneapolis, MN (November 2013 to December 2014)

- A one-year assignment to the General Counsel and Legal Services organization, dotted line report to the Deputy General Counsel.
- Built a constructive relationship between IT and Legal Services. Provided IT leadership with a better understanding of the unique business requirements of in-house corporate counsel.
- Legal practice included transactional work and investigations of whistleblower & EEOC complaints.
- Led the successful implementation of an Early Case Assessment tool (Autonomy Investigator/ECA).

Systems Analyst, IBM Global Services, Minneapolis, MN (October 2000 to July 2008)

- Liaison between the business customers and the IT organization, focusing on the evaluation, selection, architectural design, and implementation of new business applications.
- Received top ratings from both customers and supervising managers.

EDUCATION

- Juris Doctor, *Magna Cum Laude*, Mitchell Hamline School of Law, St. Paul MN (May 2011)
- Certificate in Dispute Resolution, Hamline University School of Law
- Bachelor of Arts, Political Science, University of Minnesota, Minneapolis MN

PRESENTATIONS

- *Information Technology Transactions: Lessons Learned from Real World Cases*, Nov 4, 2019, Minnesota CLE Tech Law Institute (with Michael R. Cohen)
- *Critical Infrastructure Protection - Cyber Security and the Bulk Electric System*, Feb 12, 2019, Minnesota State Bar Association
- *Tailoring Enterprise Incident Management for CIP Compliance*, May 25, 2017, Mid-Continent Compliance Forum

OTHER QUALIFICATIONS, EXPERIENCE AND VOLUNTEERISM

- LEAN Practitioner
- ITIL v3 Foundations Certified
- Licensed Minnesota attorney
- Chair, Technology Committee, Minnesota State Bar Association (MSBA) (2015 to 2018)
- Council member, MSBA Tech Law Section (2018 to present)
- Council member, MSBA Public Utilities Section (2021 to present)
- Associate Editor, Hamline Law Review
- Board member, Friends of Saint Paul College Foundation
- Board president, Xcel Energy Employee Political Action Committee
- Volunteer Service Award, BestPrep (2020)

Sum of Total			Activity Year		
Major category	Project ID	Project Nbr Desc	2022	2023	2024
Aging Technology	D.0002011.008	ITC-2020-21 WAN Black Dog HW MN	1,000		
	D.0002011.013	ITC - WAN Routine HW NSPMN	3,999,000	4,500,000	5,000,000
	D.0002021.001	Purch Facility IT Investments HW MN	1,002,428	1,002,428	649,912
	D.0002038.004	DEMS Ph4 HW MN-10756		24,863,848	
	D.0002038.010	ITC-Purch DEMS HW MN		2,725,854	
	D.0002062.001	Mainframe Modernization SW MN	1,166,720	465,800	698,968
	D.0002082.001	Video Conf SW MN	464,231	927,016	463,653
	D.0002086.001	2022 Remittance SW MN	475,834		
	D.0002106.001	Purch VOIP Refresh HW MN	2,020,617	1,179,963	1,049,419
	D.0002109.005	ITC-Rugged Tablets Refresh Routine	1,286,000	1,286,000	315,000
	D.0002111.008	ITC-SubTran Portal App SW 200123 MN	1,016,872		
	D.0002125.001	DR Tech SW MN	5,030,000	1,006,000	1,006,000
	D.0002149.001	DRMS PH 2 SW MN	1,946,000	208,500	
	D.0002153.001	Technology License SW-MN	2,568,259	25,190,069	2,565,063
	D.0002160.001	2023 Oracle SW MN		1,405,080	
	D.0002161.001	OSI Soft PI Ent Agree SW MN	583,840		
	D.0002174.003	ITC-MT Security SW MN	3,541,527		
	D.0002174.004	ITC-Purch-Cap MT Secur Comp HW MN	581,624		
	D.0002175.001	Sentinel 2.0 EL SW Nuclear MN	80,000		
	D.0002176.001	SAP Purge Archive SW MN	1,221,480	113,100	
	D.0002179.001	Enterprise Proj Port Mgmt SW MN			7,228,468
	D.0002240.002	ITC - HCM Kronos Timekeepin SW 2001		5,635,666	
	D.0002240.006	ITC - HCM Core Payrll Bnfts SW 2001		7,911,306	
	D.0002260.001	ITC - 2022 Oracle Licenses SW - MN	1,516,814		
	D.0002262.001	ITC - Real Prop Asset Upg Repl MN	100,931		
	D.0002286.019	ITC PI for Wind Farms OSI PI Lic HW	45,000		
	D.0002333.001	ITC ISO Intrfc & Stlmt Rpl SW MN-20	4,540,303		
	D.0002336.001	ITC Upgrade Nucl SAP and Records SW	686,771		
	D.0002338.001	ITC Transform Ops Reporting SW MN		3,738,942	
	D.0002339.001	ITC Tech Business Mgmt SW MN-200097	407,485		
	D.0002340.008	ITC - Oracle Exadata Refresh HW MN	2,551,964		
	D.0002350.003	ITC-SAS BookRunner Upgra SW 200134		2,710,465	
	D.0002354.001	ITC-PC Refreshes-Routine HW-NSPM	1,526,116	880,000	1,000,000
	D.0002354.009	ITC-PC Refreshes-Routine HW NUC HW		230,141	271,191
	D.0002355.001	ITC-Printer Refreshes-Routine HW-NS	600,000	500,000	448,000
	D.0002355.009	ITC-Printer Refresh Routine NUC HW	450,000	500,000	403,000
	D.0002356.001	ITC - IT INFS Network Refresh HW NS	3,500,004	3,375,000	5,250,000
	D.0002373.001	ITC-Motorola LMR Core HW MN	2,446,068		
	D.0002376.001	ITC-Infrastructure Modernization HW	5,000,000	6,500,000	7,500,000
	D.0002376.021	ITC-Monticello Server Refresh HW MN	1,256,818		
	D.0002378.003	ITC-O365 Email Legal Hold SW 200074	643,981		
	D.0002440.003	ITC-IEE 8.2 to 10.0 Conv SW 200170	841,838		
	D.0002442.001	ITC-Prairie Island Process Comput S		1,193,134	
	D.0002442.002	ITC-Prairie Island Process Comput N		2,912,107	
	D.0002447.001	ITC-PI Sec Comp Refresh NP MN		4,550,357	
	D.0002452.001	ITC-Loss Prevent. Tracking SW 20009	409,185		
	D.0002458.003	ITC-ARCS Replacement SW 200170 MN		471,626	
	D.0002462.003	ITC-MV90xi to IEE Conv SW 200170 MN		575,910	
	D.0002482.005	ITC-LFCM End User NP Routine HW MN	2,326,444	2,321,199	2,414,510
	D.0002488.005	ITC-LFCM OT Modernization NP Rout H	3,813,097	3,827,948	3,677,526
	D.0002489.005	ITC-LFCM Infra Svcs NP Rout HW MN	2,609,781	2,600,853	2,657,964
	D.0002500.001	ITC-Fabric Refresh NP MN	650,000		
	D.0002503.001	ITC-Orbus iServer SW 200148 MN	507,254		
	D.0002504.001	ITC-CASB beyond MCAS Upgrd SW 20014	1,518,428		
	D.0002510.001	ITC-Avaya License SW 200172 MN		5,890,251	
Aging Technology Total			**64,933,715**	**121,198,563**	**42,598,673**
AGIS	D.0001723.004	ADMS SW MN	3,698,610		
	D.0001723.027	Purch ADMS EL Net Server GO MN	859,584		
	D.0001901.008	AGIS Meter Data Mgmt (MDM) SW MN		6,646,679	446,399
	D.0001901.033	Purch AMI Server HW MN	1,500,000		
	D.0001901.062	AMI-DI-BS-HW-NSPM	1,645,953		
	D.0001901.065	AMI-Meter-Data-Lake-BS-SW-NSPM		1,848,343	
	D.0001901.071	AMI-SW-License-BS-NSPM-NEW	2,783,888	3,484,500	1,818,001
	D.0001901.079	AMI-KX-BS-SW-NSPM		411,303	
	D.0001908.053	AGIS-BS-Cap-SW-Cont-AMI-NSPM		3,860,764	5,400,000
	D.0001908.061	AGIS-BS-Cap-SCom-Cont-IVVO-NSPM			150,187
AGIS Total			**10,488,035**	**16,251,588**	**7,814,587**

Customer	D.0002037.022	CXT Cust Serv Console SW MN-10786	1,201,829		
	D.0002137.001	CRS Tech Stack SW MN	169,117		
	D.0002137.010	ITC-CRS Tech Stack SW 200171 MN	12,217		
	D.0002209.009	ITC-Itron Mobile App SW 200170 MN	509,234		
	D.0002209.015	ITC-2020 HH Refresh Routine HW MN	9,000		
	D.0002222.002	BUD-ITC CRS App SW MN	1,749,345		
	D.0002246.001	BUD-CXT NSPMN	4,249,529	1,218,164	435,059
	D.0002253.007	CXT-CIAM SW Ph2-NSPM	325		
	D.0002300.009	ITC-CRS Data Purge SW 200171 MN	3,328		
Customer Total			**7,903,925**	**1,218,164**	**435,059**
Cyber Security	D.0001807.001	IT Security Blanket SW MN	834,340	11,106,537	13,103,160
	D.0002269.009	ITC-OT Shared Services Ph 2 HW MN	1,500,000	1,373,301	1,498,301
	D.0002296.001	ITC Security Remediation SW MN-2000	1,023,960		
	D.0002371.003	Vulnerability and Patch Management	231,996	231,996	231,996
	D.0002384.003	ITC-Analog Security Camera Routine	500,000	500,000	750,000
	D.0002408.001	ITC-Nuclear WiFi Expansion Projec N	705,000		
	D.0002416.001	ITC-Verint Camera Server NP MN	960,380		
	D.0002418.001	ITC-SIEM-SOAR SW 200148 MN	3,373,570		
	D.0002478.001	ITC-Firewall Rule Mgmt SW 200148 MN	2,674,964		
	D.0002497.001	ITC-Vulnerability Scanning SW 20014	1,062,900		
	D.0002498.001	ITC-Tanium Refresh License SW 20014	506,143		
	D.0002499.001	ITC-PingFed MDHA SW 200148 MN	642,801		
	D.0002501.001	ITC-Data Loss Prevention SW 200148	759,214		
	D.0002502.001	ITC-XE Nuclear Drone Analysis SW MN	514,791		
	D.0002505.001	ITC-Visitor Management SW 200148 MN	253,071		
	D.0002506.001	ITC-Mandiant Sec Validation SW 2001	759,214		
	D.0002507.001	ITC-PingFed v10 Upgrade SW 200148 M	253,071		
	D.0002509.001	ITC-Enterprise File Encryp SW 20014	737,400		
Cyber Security Total			**17,292,814**	**13,211,834**	**15,583,457**
Emergent Demand	D.0002059.001	BUD-IT Blanket-Net Strategy HW MN	(1,197,674)	5,441,112	7,249,797
	D.0002061.001	IT-Blanket-Service Delivery SW MN	1,344,357	(2,755,105)	699,330
	D.0002428.001	IT-Blanket-Dgtl Analytic and Innov	(2,939,208)	1,694,470	4,824,080
Emergent Demand Total			**(2,792,525)**	**4,380,477**	**12,773,207**
Enhance Capabilities	A.0001707.008	ITC-BUS SYS Dakota Range WIND SD	1,000		
	D.0002020.015	BUD-SAP Continous Improve SW MN	2,291,850	2,287,488	1,373,019
	D.0002044.001	Enterprise Metadata Manager SW MN	1,120,051		
	D.0002131.001	OSI PI ENV CM SW MN		699,242	
	D.0002181.005	ITC-Strategic Fiber Deploy -HW MN		23,311,048	
	D.0002277.003	ITC - Crew Time Entry App MN	3,896,140		
	D.0002283.009	ITC - Avaya Ref Cloud Depl MN SW-10	255,200		
	D.0002363.002	ITC-Data Science Models MN	578,556		
	D.0002374.001	ITC-User Modernization HW MN	475,000	500,000	250,000
	D.0002395.007	ITC-Digital Ops Comm SW 200184 MN	431,416		
	D.0002398.005	ITC-EDX Signal Microwave SW 200184		2,103,198	
	D.0002399.019	Shk Tnk - QR Code NSPM	69,182		
	D.0002402.003	ITC-Broadridge SW 200171 MN	358,657		
	D.0002409.003	ITC-Integration Resiliency SW 20007	75,619		
	D.0002422.001	ITC-Nuclear APM Phase 2 SW MN		7,660,087	
	D.0002427.003	ITC-ES APM Phase 2 SW 200137 MN			2,467,344
	D.0002427.008	ITC-ES APM Phase 2 NP MN			200,000
	D.0002430.003	ITC-Dist. Sched. PhII SW 200119 MN		1,560,570	
	D.0002431.001	ITC-Nuclear Online Work Mgmt SW MN		4,658,367	
	D.0002432.003	ITC-EXT Mobile Application SW 20007	4,586,789	4,578,059	4,579,813
	D.0002434.003	ITC-Meter-to-Cash Resilincy SW 2001		3,607,858	
	D.0002437.003	ITC-TAHA Phase 2 SW 200123 MN	1,445,787	979,343	
	D.0002438.003	ITC-Data Science Tool SW 200074 MN	304,277		
	D.0002439.001	ITC-Electronic Work Package (eWP) S	2,985,789		
	D.0002448.001	ITC-NAD Server Refresh NP MN	1,682,720		
	D.0002449.003	ITC-Alteryx SW 200074 MN	445,500		
	D.0002449.007	ITC-Alteryx Server HW NP MN	250,000		
	D.0002450.003	ITC-Multi-Stat Cust Refun SW 200171	357,349		
	D.0002451.003	ITC-Worktool Consolidation SW 20017	357,349		
	D.0002454.001	ITC-FARR replacement SW 200097 MN	366,154		
	D.0002455.003	ITC-Outage Report w/o CRS SW 200119	247,229		
	D.0002456.001	ITC-Dist and Gas Planning SW 200097	226,587		
	D.0002457.001	ITC Bananatag Int Email Anl SW 2001	196,148		
	D.0002459.001	ITC-SharePoint Arch Align SW 200148	167,533		
	D.0002460.003	ITC-Enterprise Lat Long Ma SW 20017		209,130	
	D.0002461.001	ITC-Meter Data Modeling SW 200097 M	66,535		
	D.0002463.001	ITC-SAP Acct Recon Tool SW 200074 M	10,077		
	D.0002464.003	ITC-SC Spend Analytics SW 200094 MN		454,415	284,118
	D.0002466.001	ITC-eSOMS Upgrade SW 200184 MN		641,545	
	D.0002467.003	ITC-HCM LMS Analytics SW 200165 MN			2,485,615

Enhance Capabilities	**D.0002468.003**	ITC-Trans Frontline En. SW 200122 M		336,855	210,615
	D.0002469.003	ITC-BI Environment Refresh SW 20008	200,075		
	D.0002470.003	ITC-Energy Supply Real Time SW 2001			266,078
	D.0002471.003	ITC-Supply Chain Perf Mgmt SW 20018			266,078
	D.0002472.003	ITC-Trans System Planning SW 200122			266,078
	D.0002473.001	ITC-Exemption Certificate SW 200171	309,850		
	D.0002474.001	ITC-Nuclear Advncd Analytic & Auto			639,304
	D.0002475.003	ITC-Dist Asset Management SW 200119			205,909
	D.0002476.003	ITC - Dist System Planning SW 20011			205,909
	D.0002477.003	ITC-Trans Cap Proj Deliv SW MN			209,564
	D.0002479.003	ITC - Ops Plan & Dispatch SW 200146			226,051
	D.0002480.003	ITC - ES Plan & Schedule SW 200184			266,078
	D.0002481.003	ITC-ES Yield Optimization SW 200184			266,078
	D.0002487.003	ITC-SupplyChain Cat Anlytc SW 20009			766,438
	D.0002490.001	ITC-Nuclear Asset Management SW MN			1,733,238
	D.0002491.003	ITC-MDO Supply Chain SW 200074 MN	944,460		
	D.0002492.003	ITC-Emp Dig Exp Intranet SW 200148	1,097,777		
	D.0002494.001	ITC-FERC Cost Traceability SW 20007	809,668	207,386	
	D.0002496.003	ITC-Kafka Expansion SW 200148 MN	737,400		
	D.0002512.001	ITC-Service Now Upgrade SW 200074 M	917,358	1,144,515	686,972
	D.0002514.001	ITC- ES APM Phase 3 SW 200137 MN		1,091,027	
Enhance Capabilities Total			**28,265,082**	**56,030,130**	**17,854,301**
Grand Total			**126,091,045**	**212,290,757**	**97,059,284**

Cost Category	2018 Actuals	2019 Actuals	2020 Actuals	2021 Actual/ Forecast	2022 Budget	2023 Budget	2024 Budget
Network Services	18.1	16.6	17.2	18.1	20.0	20.7	21.0
Software License and Maintenance	24.5	24.9	29.8	35.6	42.8	44.4	45.8
Company Labor	17.2	17.5	19.1	19.6	22.3	23.1	24.2
Distributed Systems Services	2.9	1.7	.5	.5	.6	.6	.7
Application Development and Maintenance	7.8	8.4	9.1	9.2	9.5	9.5	9.6
Contract and Consulting	9.2	7.8	6.7	4.4	5.2	5.1	5.2
Shared Assets	(1.6)	1.8	5.3	(4.9)	(2.8)	1.2	6.9
Hardware Maintenance and Purchase	2.8	2.9	2.7	3.5	3.5	3.5	3.6
Employee Expenses	.7	.8	.4	.2	.5	.5	.6
Mainframe	1.1	1.1	.6	.5	.9	.9	.9
Other	2.8	.8	2.2	.1	.8	.8	.8
AGIS	.0	1.3	2.1	4.9	6.4	15.0	15.5
Total	85.7	85.7	95.6	91.6	109.6	125.4	134.6
Total Excluding AGIS	85.6	84.4	93.5	86.7	103.2	110.3	119.1

Xcel Energy

Customer Experience Satisfaction
Performance Trends

September 2019

CX MEASUREMENT AT XCEL ENERGY

Channels

Contact Center
Phone Agent & IVR

Website & My Account

Mobile App

Notifications

Email Correspondence

Customer Connection

Key Moments

Start/Stop/Transfer service

Billing & Paying

Outage Reporting & Notifications

Finding Solutions

New Construction

Xcel Energy

OVERVIEW OF CUSTOMER EXPERIENCE SURVEYS

Capturing feedback from over 370,000 customer responses since launching our new surveys starting in 2016 or later

Channel	Description	Customer Responses since Launch	Launch Date
Website	Online pop up survey offered to 100% of customers visiting XE.com and My Account	79,489	2016
Mobile App	Measures satisfaction and ease of use within the mobile app	3,293	2018
Contact Center Agent (Experience survey)	Phone survey to customers completing a transaction with an Xcel phone agent	34,626	2016
Contact Center Agent (Post Call survey)	Brief automated IVR survey to customers completing a transaction with an Xcel agent	164,523	2016
Contact Center IVR	Brief automated IVR survey to customers completing transaction through the IVR	36,338	2016
Email Correspondence	Online survey to customers corresponding via e-mail with an Xcel contact center agents	6,639	2018
Outage Notifications	Online survey that measures satisfaction, ERT accuracy & timeliness (text/email)	45,611	2017
Customer Connection	Measures satisfaction with all phases of installing and connecting new electric and/or natural gas service process	2,167	2017

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Key Takeaways & Recommendations

As more customers move toward completing transactions in our **digital channels**; satisfaction has been worsening. Scores have significantly declined in 2019 in our Website and Mobile App, while our non-digital channels (Agent, E-mail) continue to significantly outperform.

Currently planned initiatives in 2019/20 to improve digital tools must proceed as scoped to pick up digital satisfaction

Billing and Payment and **Outage** satisfaction continue to trend significantly lower for the website channel compared to non-digital channels.

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Overall Digital & Non Digital Trend

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Large Satisfaction Gap Exists Between Digital and Non-Digital

Digital channels are scoring significantly lower than last year, and continue to score significantly below non-digital channels

Non-Digital Yearly Trend - OSAT

86%
85%
87%
86%
85%
84%
83%
81%
87% ↑
86% ↑

— Agent Experience
— Post Call
— IVR
— Email Corr

↑ Significantly *higher* than 2018

2016   2017   2018   2019 YTD*

*1/1/19 – 9/22/19

Digital Yearly Trend - OSAT

— Website
— Mobile App

67%
70%
70%
66% ↓
62%
69%
55% ↓

↓ Significantly *lower* than 2018

2016   2017   2018   2019 YTD*

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Large Digital Gap Also Exists for Key Attributes

Key attributes from the survey that provide insights to satisfaction performance show that web satisfaction is low across all attributes with the exception of readability.

Digital True Driver Analysis: *Website – Total*

Takeaway: As of mid-year 2019, all diagnostics fell below 2018 YE levels for the website. Through late Sept 2019, all attribute scores have significantly declined compared to last year.

Performance (% Top 2 Box)	2018	YTD 2019*
Quality of info	66	62 ↓
Readability of the pages	72	68 ↓
Site layout helps you find items	64	61 ↓
Search results help with decisions	64	59 ↓
Ease of navigation	67	63 ↓
Easy to understand information	68	64 ↓
Info about ways to pay your bill	67	64 ↓

*YTD = 1/1/19 – 9/22/19   ↓ Significantly *lower* than 2018

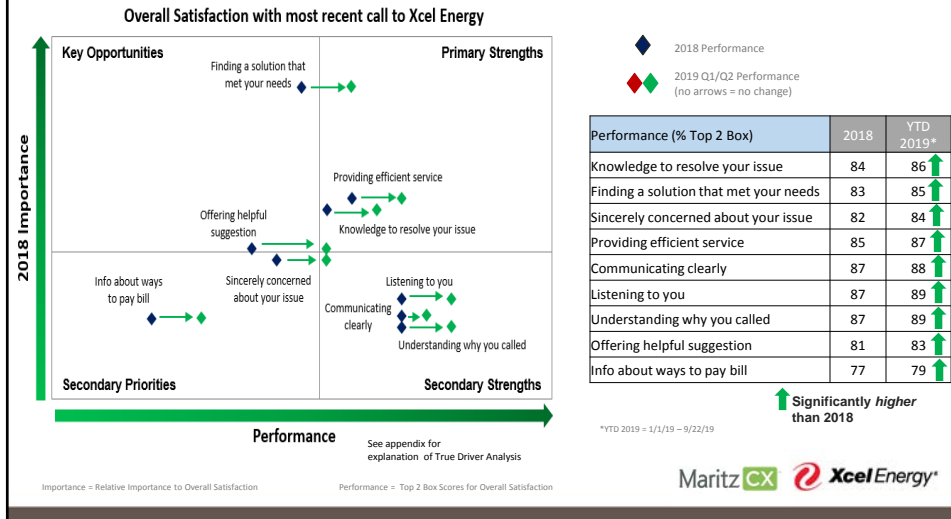Importance = Relative Importance to Overall Satisfaction   Performance = Top 2 Box Scores for Overall Satisfaction
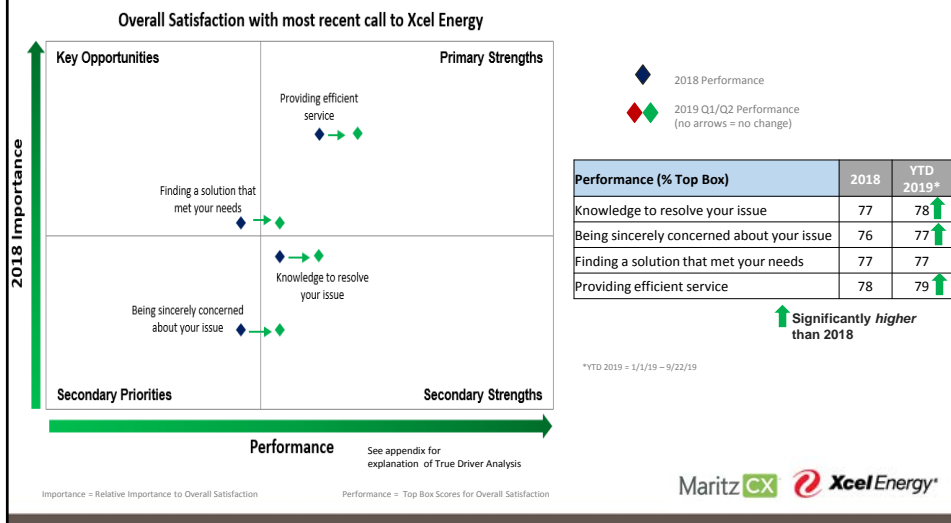
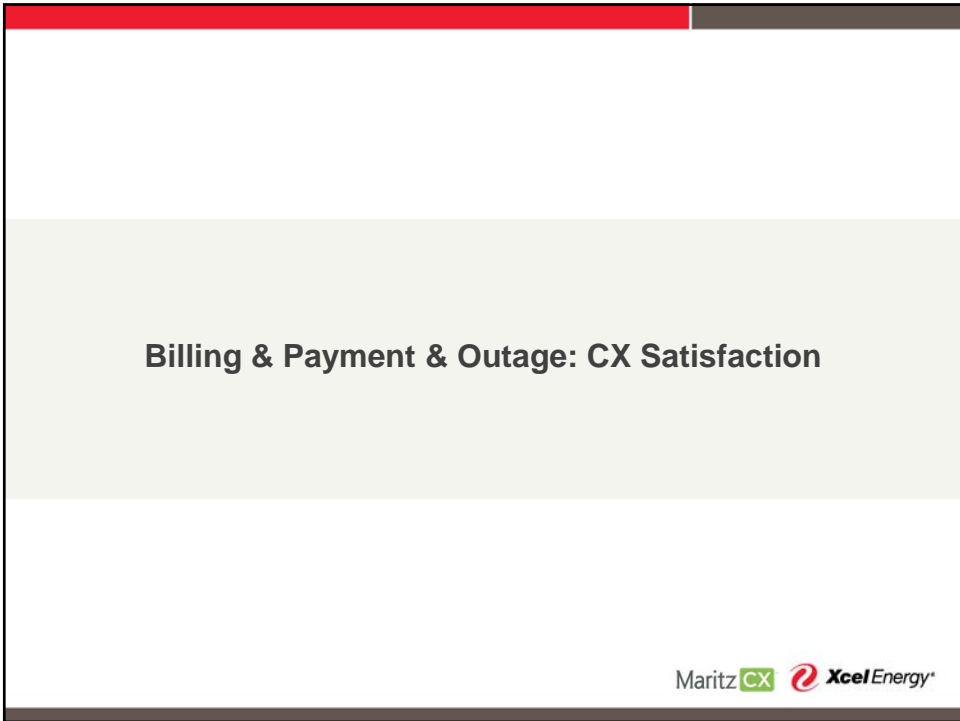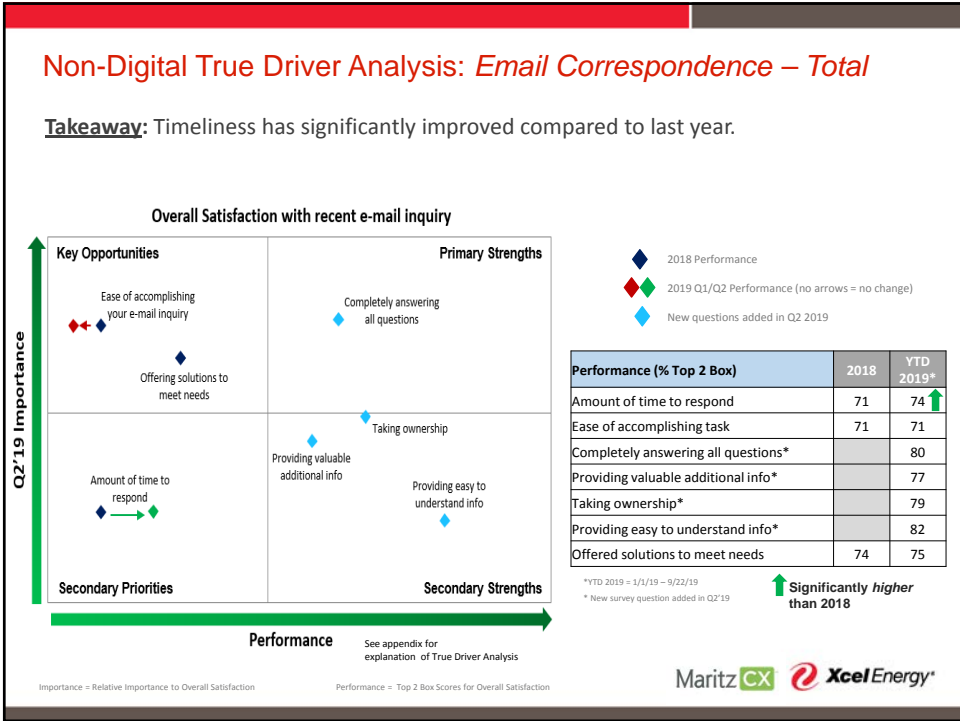## Non-Digital True Driver Analysis: *Agent Experience – Total*

Takeaway: The Phone/Agent channel continues to perform strongly for the tested diagnostics; as of Q2 2019 there were four primary strengths for this channel.
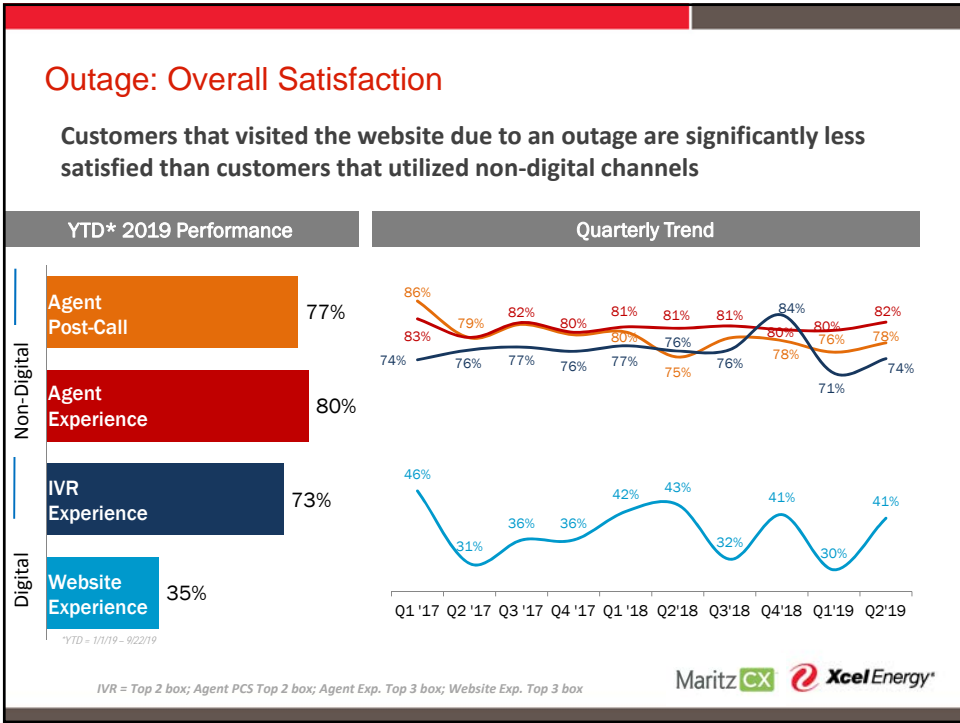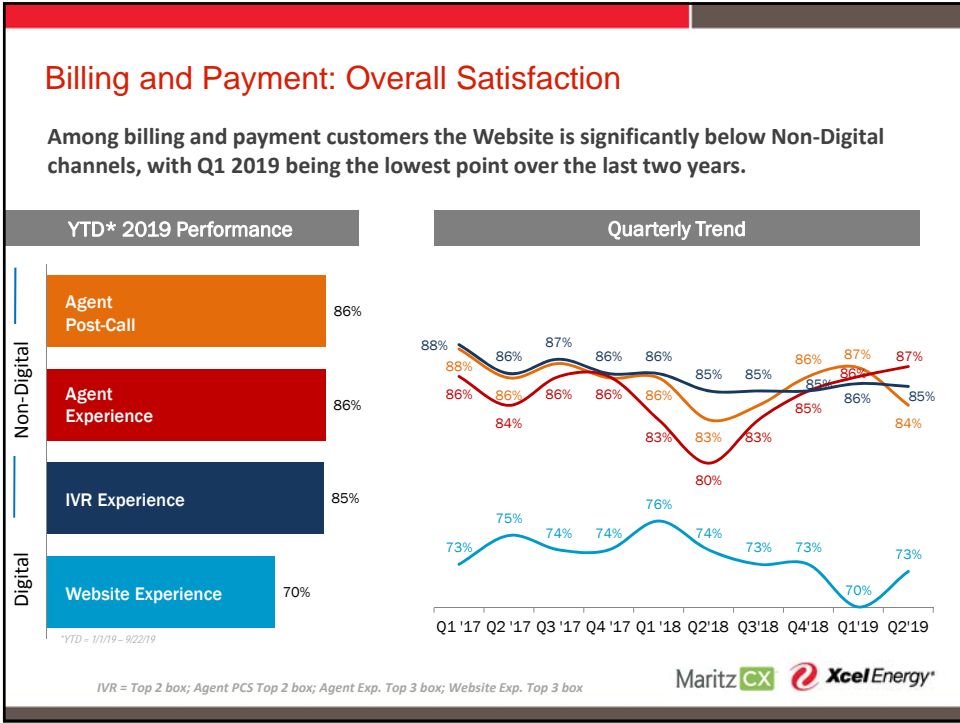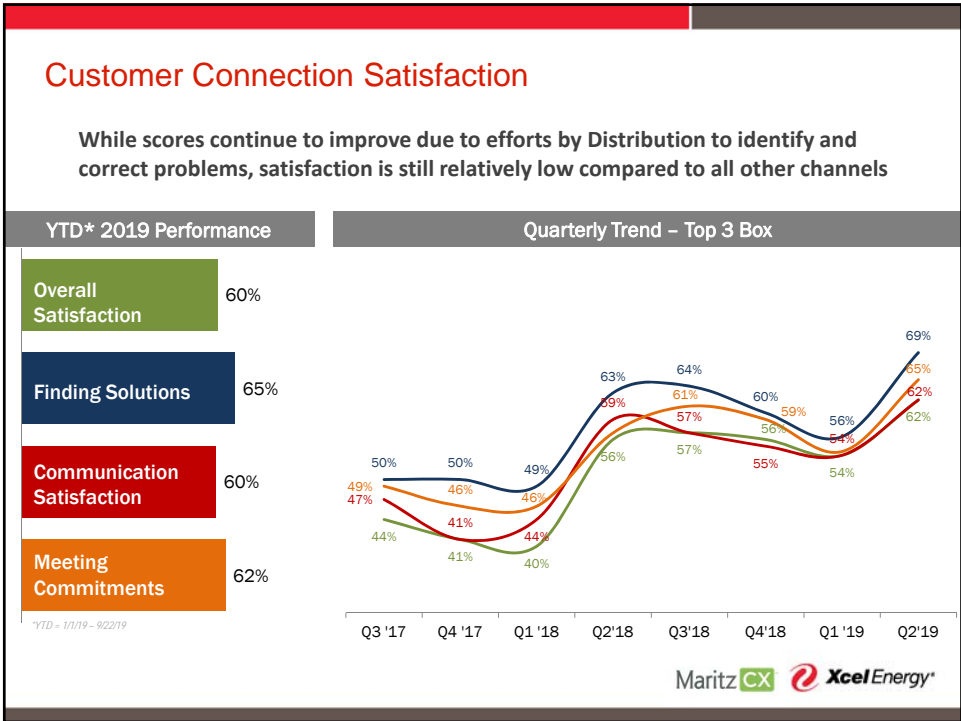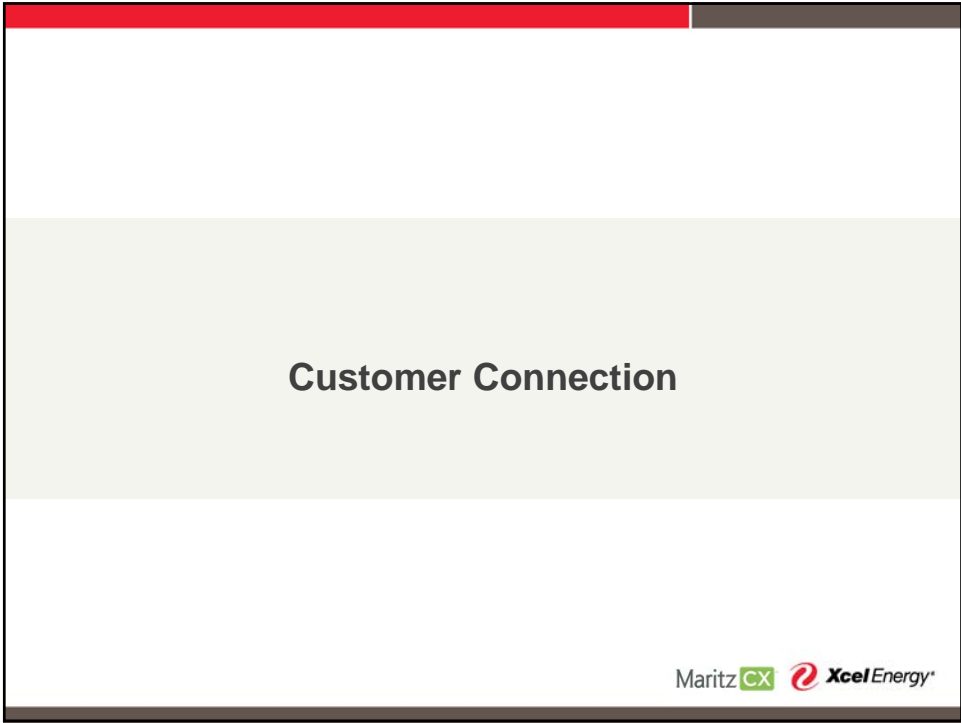
Overall Satisfaction with most recent call to Xcel Energy

Performance (% Top 2 Box)	2018	YTD 2019*
Knowledge to resolve your issue	84	86 ↑
Finding a solution that met your needs	83	85 ↑
Sincerely concerned about your issue	82	84 ↑
Providing efficient service	85	87 ↑
Communicating clearly	87	88 ↑
Listening to you	87	89 ↑
Understanding why you called	87	89 ↑
Offering helpful suggestion	81	83 ↑
Info about ways to pay bill	77	79 ↑

↑ Significantly *higher* than 2018

*YTD 2019 = 1/1/19 – 9/22/19

See appendix for explanation of True Driver Analysis

Importance = Relative Importance to Overall Satisfaction   Performance = Top 2 Box Scores for Overall Satisfaction

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Non-Digital True Driver Analysis: *Agent Post Call – Total*

Takeaway: We have also seen significant improvements in the Agent Post Call Study for all attributes except for Finding Solutions

Overall Satisfaction with most recent call to Xcel Energy

Performance (% Top Box)	2018	YTD 2019*
Knowledge to resolve your issue	77	78 ↑
Being sincerely concerned about your issue	76	77 ↑
Finding a solution that met your needs	77	77
Providing efficient service	78	79 ↑

↑ Significantly *higher* than 2018

*YTD 2019 = 1/1/19 – 9/22/19

See appendix for explanation of True Driver Analysis

Importance = Relative Importance to Overall Satisfaction   Performance = Top Box Scores for Overall Satisfaction

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Non-Digital True Driver Analysis: *Email Correspondence – Total*

Takeaway: Timeliness has significantly improved compared to last year.

Billing & Payment & Outage: CX Satisfaction

Billing and Payment: Overall Satisfaction

Among billing and payment customers the Website is significantly below Non-Digital channels, with Q1 2019 being the lowest point over the last two years.

Outage: Overall Satisfaction

Customers that visited the website due to an outage are significantly less satisfied than customers that utilized non-digital channels

Customer Connection

Maritz CX Xcel Energy

Customer Connection Satisfaction

While scores continue to improve due to efforts by Distribution to identify and correct problems, satisfaction is still relatively low compared to all other channels

YTD* 2019 Performance	
Overall Satisfaction	60%
Finding Solutions	65%
Communication Satisfaction	60%
Meeting Commitments	62%

*YTD = 1/1/19 – 9/22/19

Quarterly Trend – Top 3 Box

Maritz CX Xcel Energy

Project Budgeting and Development: the Technology Investment Governance Process

A. Initial project budget development

Business Systems' budget development, project prioritization, and project management leverages an established Technology Investment Governance (TIG) process. As part of the TIG process, key business and IT leaders are accountable for managing demand intake, prioritization, and business outcomes of the IT projects in their portfolios as they move from project inception towards in-service, thereby ensuring that projects comply with IT portfolio and project management requirements. TIG leadership is comprised of executive level and senior business leaders in a partnership with IT leadership. IT works with each business area to determine its specific IT needs, and then these needs are prioritized based on a particular set of factors. Specifically, each Business Systems area is responsible for partnering with a specific business area within the organization to determine that area's long-term strategic objectives, and identify whether IT investments can enable achievement of those objectives. In turn, these priorities are converted into a proposed Business Systems budget. The TIG process also oversees and approves any changes in project scope or budget at the corporate level based on overall Company priorities and spending levels.

B. Converting project ideas into the Business Systems budget

From the idea stage, project ideas are grouped and evaluated, ranked, and selected based on a common set of filters. This process weighs a multitude of criteria including: (1) the financial and non-financial benefits of a project; (2) the potential for other existing technologies to address the business need; and (3) the degree to which the project is needed to meet regulatory requirements or to ensure system reliability and security. This categorization process allows Business Systems to evaluate the benefits and risks associated with each project idea, and results in a list of ranked project ideas.

C. The next step after the project ideas are ranked

Under the TIG process, the Company reviews the ranked project ideas to determine which projects should be implemented and included in the Business Systems budget. This process requires further refinement of the budget figures for each project, and prioritization of possible projects until a final budget is set.

D. How projects are governed once approved for inclusion in the budget

Business Systems employs a "gated" approval process called the "Governance Gates Process" to oversee IT projects throughout their lifecycle. Projects move through specific gates or approvals under the TIG process. The Governance Gates Process enables regular review of project metrics (schedule, scope, deliverables), and institutes corrective action plans or modification as appropriate.

E. The different gates or approvals that are part of the Governance Gates Process

The five gates that each capital project must complete before it is initiated and ultimately placed in service are as follows: (1) Approval to Initiate; (2) Alignment to Design; (3) Alignment to Build; (4) Alignment to Launch; and (5) and Project Closure.

Gate 1: Approval to Initiate

Under the TIG process, if it is determined that a project should move forward, the first governance gate is "Approval to Initiate," which is the official start of the capital project. Approval to Initiate includes a delivery checklist, a stakeholder identification and analysis, an official project plan, risk logs, and operational readiness.

Gate 2: Alignment to Design

The next gate is the "Alignment to Design." The purpose of this approval is to ensure that the initial budget and schedule have been adequately documented since the "Approval to Initiate" gate, and that the strategy is appropriately developed to move the project forward.

Upon approval of this gate, the project profile, requirements, security project risk assessment, budget, and schedule are assessed and modified as appropriate.

Gate 3: Alignment to Build

The next gate is "Alignment to Build." This approval provides the final check of a project before construction begins to ensure that the proposed design meets the

identified needs and any technical problems are resolved.

At this gate, the project is reviewed and validated by the Architecture Governance Panel (AGP) to ensure that the project satisfies its intended business objectives. Overall project status, technical solutions, software products, documentation, and definitive estimates are reviewed to ensure completeness and consistency with design standards and to resolve any technical issues with the project. After an AGP Decision is obtained at this gate, the project team will begin to build and deploy the project.

Gate 4: Alignment to Launch

The next gate is "Alignment to Launch." This is a formal inspection also conducted by the AGP to determine whether the technology solution is ready to be placed in service. The business unit sponsoring the solution must also approve the project at this stage, and confirm that it meets the business unit's objectives, and that the operational procedures and tools (such as user training) are in place to ensure its successful and secure operation in the production environment.

Gate 5: Project Closure

The final gate is "project closure." This gate is the formal close out of the project verifying the solution has been transitioned to operational steady state and storing all project artifacts.