EXH. MFH-1T
DOCKETS UE-18___/UG-18___
2018 PSE EXPEDITED RATE FILING
WITNESS: MARGARET F. HOPKINS

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of: **PUGET SOUND ENERGY** **Expedited Rate Filing**	**Docket UE-18____** **Docket UG-18____**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

MARGARET F. HOPKINS

ON BEHALF OF PUGET SOUND ENERGY

NOVEMBER 7, 2018

PUGET SOUND ENERGY

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PUGET SOUND ENERGY

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Margaret F. Hopkins and my business address is 355 110th Ave. NE, Bellevue, Washington 98004. I am employed by Puget Sound Energy ("PSE") as Vice President and Chief Information Officer.

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes. It is the First Exhibit to my Prefiled Direct Testimony, Exh. MFH-2.

Q. Please briefly describe your responsibilities as Vice President and Chief Information Officer of PSE.

A. I am responsible for leading PSE's Information Technology ("IT") and cyber security program and building and managing the infrastructure, technologies, systems, and data that enable PSE to support our customers and achieve business success. I am also responsible for PSE's Business Excellence program, an enterprise-wide initiative to drive efficiencies by removing barriers to productivity, streamlining processes and promoting innovation.

Q. Please summarize the purpose of your testimony.

A. My testimony provides an overview of PSE's IT strategy and an overview of the technology investments placed in service since the end of the test year for the 2017 general rate case.

II. PSE IS APPROPRIATELY INVESTING IN IT SYSTEMS TO SUPPORT CUSTOMER NEEDS NOW AND IN THE FUTURE

Q. Please provide a high-level overview of the role IT Systems play in the transformation of the utility industry.

A. Utilities are undergoing tremendous change and transformation. Rapid advancements in IT have altered the methods utilities use to operate and transform, as they become increasingly dependent on technology solutions to enable business objectives such as reliability, resource efficiency, and customer service. Technology assets are as foundational as the classic pipes and wires that deliver service to our customers and are inextricably linked to advancing, securing, and enabling the day-to-day operation of our gas and electric service.

Consumer behaviors are also driving change. With the rapid evolution of digital customer engagement, customers are demanding information on their energy usage, payment history and service options; and they want the ability to interact with their utility 24/7, on their own terms, and via the communication channel(s) they prefer. Those channels can include online, mobile, interactive voice response systems, or simply a telephone call to an agent at the call center. Regardless of the channel, PSE customers expect to have the same (consistent) information

available to easily transact business with us. Our Get To Zero ("GTZ") program, discussed later in my testimony, was launched in response to these changing expectations with the ultimate objective of improving the end-to-end customer experience for all PSE customers.

As the utility industry has transformed, so has the IT landscape that supports it. Security, advanced technology, and customer expectations are creating a highly dynamic and demanding operating environment requiring us to raise our customer commitment to a new level and forcing a paradigm shift in IT investments. Cloud has become a critical choice in providing technology solutions to meet business challenges. IT vendors are forcing customers to the cloud by eliminating the option to purchase and host these technologies in their own data centers. Cyber security and data privacy are front and center in every IT investment. The cyber threat to the electric grid, both nationally and globally, has driven a change in how IT solutions are architected. Every system must be designed not only to meet business needs but to meet them in a secure manner that protects the grid and maintains the privacy of our customers' sensitive information. This dynamic has also driven an increase in the cost of IT solutions.

Q. What is PSE's strategy for making technology investments?

A. PSE's overarching IT investment strategy is to provide reliable, cost effective, secure technology solutions that support critical business operations, meet customer expectations, and enable key business objectives. In order to achieve

that objective, we adhere to a set of established technology principles that guide our investment decisions:

1. **Plan** – Technology roadmaps and plans are developed at the enterprise and business levels, balancing cost risk, function, and the future needs of PSE and its customers. These plans align Company and customer needs with supporting technology solutions and influence the priority and timing of technology investments for current and future years.
2. **Acquire** – A cost benefit analysis is developed by management to support the need for each technology initiative, outlining the business problem, various solutions, and the risk, cost and benefits associated with each option. Total cost of ownership is considered at all decision points, with a bias toward cost effectiveness and optimization of prior technology investments. We make every effort to minimize cost by leveraging existing technology assets and maximizing their use. If an existing IT asset meets the majority of business and/or technical requirements, we will build upon the existing platform to the extent possible. By leveraging existing assets and vendor relationships, we optimize cost through volume discounts and lower integration costs. PSE's SAP platform is a good illustration of this principle. By building upon the SAP platform to implement our Financial Transparency and Improvement Program ("FTIP") discussed in the Prefiled Direct Testimony of Matthew R. Marcelia, Exh. MRM-1T, we were able to capitalize on the existing platform and integrate more easily into the current IT infrastructure. This

keeps implementation costs in line and allows us to use in-house skillsets familiar with the technology to deliver solutions more quickly. When an existing system does not meet business requirements, we evaluate multiple options with a preference toward "cloud" or "purchased" products. In doing so, we lower development and maintenance costs, align with industry best practices, and increase speed of implementation. We also avoid developing highly customized systems that are difficult and costly to maintain. All purchases follow a standard contracting and procurement process to obtain the best value for PSE and our customers.

3. **Design** – Once selected, we design each system to meet the stated business requirements and avoid over-reaching or gold plating with extraneous functionality. Cyber security, availability, and disaster recovery capabilities are paramount and designed into the system in accordance with PSE's security and compliance obligations such as those imposed by the North American Electric Reliability Corporation-Critical Infrastructure Protection ("NERC-CIP"). We architect for reuse, adaptability, growth, ease of operation and speed, and standardize and consolidate where possible. We also embed data governance and data management best practices into our design to ensure that customer, asset, and employee data is protected and accurate. We apply this rigor across all technology platforms to achieve maximum value from prior investments and to minimize the overall growth of ongoing IT expenses.

4. **Operate and Secure** – Once operational, we properly maintain and keep our assets current. Technical currency is necessary to keep the systems available and secure. Hundreds of vulnerabilities are introduced into the technology landscape each month, and all systems must be patched to ensure the proper security protections are in place, particularly as we see an increase in the viruses and malware specifically targeted at the grid. These patches are not built to support out-of-date systems, so we must invest in upgrades on a continual basis. We follow security best practices and adhere to corporate policy and compliance obligations to protect PSE systems and data from unauthorized use and disclosure. We benchmark our security practices against the National Institute of Standards and Technology ("NIST") framework – the recommended cyber security framework for critical infrastructure as outlined in Executive Order 13636.[1] This framework allows us to assess the maturity of our security protections and identify gaps that require additional efforts and investment to further strengthen our security posture. Our Data Center and Disaster Recovery program (more details below) is an example of an IT investment put in place to manage cyber and business continuity risk and to protect the systems and data critical to PSE's gas and electric operations.

[1] Executive Order: Improving Critical Infrastructure Cybersecurity (Feb. 12, 2013), available at https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/executive-order-improving-critical-infrastructure-cybersecurity.

Q. What process does PSE undertake before purchasing new system applications and infrastructure?

A. Guided by the principles outlined above, PSE conducts cost/benefit analyses in advance of incremental system purchases. We work with technology vendors that provide business solutions that create long-term economies of scale and competitive advantages for PSE's customers. Through PSE's contract services group we acquire technology that is competitively priced, reliable, and relevant to the utility industry and the manner in which we serve our customers. The competitive bid process allows us to enable scale economies in pricing and ongoing maintenance, thereby providing a lower total cost of ownership on behalf of PSE's customers.

Q. What are PSE's major systems initiatives?

A. PSE is currently involved in several large, transformational efforts that require significant IT spending. These include the following:

- **"Get to Zero" Program:** GTZ is PSE's customer-focused, digital transformation initiative. This six-year program (2016-2021) is transforming the customer service experience with expanded and consistent digital self-service options, removing obstacles for customers, providing proactive communications, and quickly anticipating and solving problems before they occur. There is also a strong emphasis on automation to drive improvements in the customer-touching areas of data analytics, data management, work

planning, scheduling and dispatch. I provide additional explanation of this initiative later in my testimony.

- **Data Center and Disaster Recovery Program ("DCDR"):** This program is focused on mitigating a significant corporate risk relating to insufficient disaster recovery capabilities of existing data center facilities and critical systems. This program replaces PSE's existing substandard data centers, which cannot meet corporate requirements for resiliency and disaster recovery, with geographically diverse, highly redundant modular facilities. It also implements the infrastructure (hardware and software) needed to meet availability and security requirements for day-to-day operations. Foundational to this program is the implementation of disaster recovery solutions that allow PSE to recover critical IT systems within 24 hours of a serious outage or catastrophic event such as an earthquake or crippling cyber attack.

- **Advanced Meter Infrastructure ("AMI"):** PSE's existing Automated Meter Reading ("AMR") infrastructure, installed between 1998-2001, is approaching the end of its useful life. A replacement strategy is needed in order to continue accurate energy billing for customers. Because AMR technology is near obsolescence, PSE was faced with the option to refurbish the existing AMR system with the same limiting one-way technology or transition to a more up-to-date, two-way AMI. PSE elected to proceed with the installation of AMI

communication network and metering equipment throughout PSE's electric and gas service territory. Installation work is underway, and full deployment is expected to be complete in 2023-2024. Information technology is a key enabler of the successful deployment of the AMI project; it includes the build out of a core network and related hardware and software systems required to securely transfer data from the meter to PSE. Additionally, to mitigate new risks that may be introduced with two-way communication paths, PSE will implement the AMI advance security option to facilitate greater protections at the meter. More detail on the AMI program is provided in the Prefiled Direct Testimony of Ms. Catherine A. Koch, Exh. CAK-1T.

- **Financial Transparency and Improvement Program:** FTIP modernized and implemented a redesign of PSE's financial systems, processes, tools and financial structure. More detail on FTIP is provided in the Prefiled Direct Testimony of Matthew R. Marcelia, Exh. MRM-1T.

Q. Please provide an overview of the IT spending for which PSE seeks recovery in this case.

A. In general, PSE's technology expenditures fall into two main categories:

System Modernization and Optimization: This category represents capital efforts required to upgrade and maintain key and critical IT application and infrastructure platforms to ensure ongoing availability, stability, security,

technical currency and vendor support. By keeping applications and infrastructure equipment at supported levels, we can continue to receive critical system and security patches, take advantage of the latest features, and maintain license compliance as defined by support agreements. Work under the Systems Modernization and Optimization category is funded annually, with proposals submitted from each of the major IT areas outlined below. The IT leadership team reviews and makes funding decisions based on business value, timing and risk.

The following areas are covered under this program:

a. IT Applications: This area ensures that the 264 systems in production are kept technically current and are properly maintained in compliance with our vendor support agreements. It also provides funding for critical applications such as the Energy Management System, Gas Control System, Outage Management System, SAP systems (Finance, HR, Call Center, Billing, and Asset Management), Metering, PSE.com, and more.

b. IT Infrastructure: This area consists of the computing and telecommunications hardware and software upon which critical business systems and capabilities are built. This is largely the IT equipment housed in our Data Centers (3500 servers) and the network and connectivity equipment that enable telecommunications throughout our service territory.

c. IT Security and Risk: This area focuses on cyber risks and the threats they pose, ensuring vulnerabilities are mitigated in alignment with the rapidly changing security landscape. Our cyber security program is based on the same national standards followed by leading companies in the energy and defense industries and is assessed annually against those standards by external security firms. Our annual assessment is utilized to evaluate our cyber security posture to ensure cyber investments are properly identified and funded under this category. Without this focus, we would not have been able to successfully protect against the over 26 million vulnerabilities that have been introduced to the IT landscape over the last several years. During this test period alone, 241 patches covering over 3000 vulnerabilities were released by Microsoft for the systems we operate.

New systems: This category includes costs associated with acquisition, development and installation of new systems based on business, operational, compliance or obsolescence needs. This work is primarily related to additions to the PSE technology portfolio which introduce new maintenance and support expense, including vendor, contract costs, hosting or cloud-related costs, and internal labor needed to ensure continued availability, resilience and security of the new asset.

As business areas identify technology enablement opportunities, they conduct a cost benefit analysis to secure funding and to formalize the

project. This process occurs annually and is used to inform the final approved IT capital budget for the subsequent year.

Exh. MFH-3 provides a listing of all new or upgraded technology that went into service after October 1, 2016[2], with a total spend exceeding $100,000, for which PSE seeks recovery in this case.

III. GTZ IS DESIGNED TO IMPROVE THE CUSTOMER EXPERIENCE FOR ALL PSE CUSTOMERS

Q. Please describe the GTZ initiative and the systems expenditures to support it.

A. The GTZ effort is a multi-year, customer-focused, digital transformation initiative with the ultimate objective of improving the end-to-end customer experience for all PSE customers. The overarching mission of the program is to reduce the need for customers to call PSE's contact center to resolve issues by eliminating pain points for customers through improvements to applications, systems and processes that make our customer experience easy and accurate regardless of channel preference. The program is broken into four basic parts: 1) Customer Interface; 2) Billing Payment Credit & Collections; 3) Integrated Work Management; and 4) Data Management & Analytics.

Under the Customer Interface program, PSE is revitalizing customer facing applications such as the website, mobile app, integrated voice response unit

[2] September 30, 2016 was the end of the test year in PSE's last general rate case.

("IVR") and social platforms, providing customers with a more robust and easy-to-use experience consistently across all channels.

Within the Billing, Payment, Credit & Collections program, PSE is evaluating and improving billing and payment functions, investing in applications to assist low income customers with scheduling agency appointments and applying financial assistance grants, enhancing billing systems to improve multiple billing processes and performance, updating payment options for customers and establishing future state capabilities which effectively leverage functionality being introduced as a part of PSE's Advance Meter Infrastructure program.

Within the Integrated Work Management program, PSE is focused on automating field work activities, so PSE can plan, schedule and close out work in a way that creates more scheduling accuracy and overall transparency for customers. This investment will establish the technology framework which will allow PSE to provide greater self-service optionality to customers and increase overall efficiency for completing work in the field.

Finally, the Data Management and Analytics program is focused on improving the accuracy and quality of appropriate customer and asset data to support all project work, establishing new processes for enterprise data governance and building out the appropriate framework to better analyze data to help improve the customer experience through various channels.

Q. Does GTZ provide benefits to PSE's customers?

A. Yes, The GTZ program is a multi-faceted, customer-first initiative that is intended to improve the customer experience and benefit all PSE customers.

Q. What steps has PSE taken to determine its customers' preferences?

A. In the initiation of the program, PSE canvased customers across its service territory to hear directly from them what their pain points were and what would elevate PSE from just their energy provider to a company they enjoy doing business with. This extensive work with customers allowed PSE to understand what specific changes to the customer experience our customers are seeking. Understanding what customers want, in their own words, laid the foundation for the GTZ program and its mission to do business so effectively that customers no longer experience issues that drive them to call. In addition to customer focus groups, PSE also spent time evaluating what others are doing in the industry to further understand where we could make improvements. At the same time, we explored our own data to help focus our efforts. In our analysis we found that customers contact PSE for five general reasons: 1) customers need help understanding charges on their bill; 2) customers want to pay their bill; 3) customers need financial assistance; 4) customers are experiencing an interruption in their service; and 5) customers have a planned service event. Within the GTZ program we refer to these categories as the "Super 5" and they have become the framework for the initiatives we are investing in to drive benefits to customers.

Q. Please summarize the focus of the GTZ program.

A. At a high level, PSE is focusing on making each customer facing tool or process easier and more consistent for our customers across various channels so customers can manage their service when it works best for them and in a way that meets their needs even if it is outside of normal business hours. Our focus is to make doing business with PSE easy, and to anticipate our customers' needs and proactively communicate with them to better manage their service. PSE is also investing in automation to help bring transparency to work being done in the field allowing customers access to more timely information and opportunities to self-serve including tighter appointment scheduling windows. Through this transformation we are also focusing on making customer information more secure to help safeguard sensitive data from external threats. As technology evolves and influences customer expectations around us, it is critically important that PSE continues to keep pace with that evolution appropriately leveraging new technologies to improve the customer experience and to meet our customers' expectations.

Q. What aspects of GTZ are in service and benefitting customers?

A. GTZ is a multi-year initiative that will stretch into 2021. As of June 30, 2018, several improvements have been put into service that are benefitting customers.

- Customer Interface: PSE has enhanced the IVR to both (i) improve our customers' ability to quickly authenticate within the phone system and (ii) streamline the system to improve customers' ability to quickly pay their

bill. As a result of making this interaction easier for customers PSE has seen a 9.1 percent increase in our IVR call containment rate when comparing year-over-year June 2018. The improvement in IVR containment helps to validate that the enhancements made it easier for customers to navigate self-service transactions; and, in certain instances, customers no longer need the assistance of a live agent. In this area, PSE has also developed a new social media platform that allows PSE to understand what issues customers are facing across various platforms and to address their issues or concerns in real time.

- Billing Payment Credit & Collections: PSE has improved account codes on customer bills to reduce confusion for customers and to bring greater clarity for charges billed. Through June 2018, we have reduced the number of miscellaneous billing adjustments by 42 percent when compared to the same periods in 2016 and 2017.We have also improved back-office applications in order to increase the timeliness and overall accuracy of bills. In this program, PSE has also implemented the "no fee bank card" enhancement and incorporated electronic bill due reminders within the electronic payment workflow to make it easier for customers to pay with a credit card. As a result, PSE has seen a year-over-year increase in credit card payments of 37 percent when comparing the first half of the year.

- Integrated Work Management: PSE has implemented a new outage communications tool to proactively communicate with customers during

electric outages. Through the GIS-CAD Design Manager project, PSE has also made advancements in automating our approach to updating system maps, which will improve the real-time accuracy of PSE's system maps. Through the implementation of PSE's new outage communication tool, year-to-date through June 30, PSE has sent more than 1,795,000 proactive notifications to customers to help them manage times of service interruption more effectively. This includes more than 877,000 notifications via email, 524,000 via text message, and 394,000 via phone, based on the customer's preference.

- Data Management & Analytics: PSE has successfully implemented a new data repository that will allow both structured and unstructured data attributes to be analyzed in real time, improving PSE's ability to glean insights and further improve the customer experience in various ways. As a result of this effort, PSE has been able to implement new natural language processing models that analyze the wrap-up notes from calls to customer service representatives. This call refinement helps the GTZ program prioritize the customer challenges it needs to tackle. This data repository, often referred to as a "data lake" will also set the stage for further analytical models to help improve the customer experience and drive improved customer segmentation for proactive communications.

Because of the GTZ projects put into service for this filing, PSE is already seeing a reduction in customer calls. Year to date through June 30, call volumes are down by 21 percent, or almost 210,000 calls when compared to our program

baseline which is the average of the calls received in the 2014-2015 calendar years.

Q. How has the PSE customer experience changed since the deployment of GTZ?

A. PSE's customer experience reached its highest-ever level of satisfaction in 2018, with PSE scoring above the West region averages in all four of the most current J.D. Power and Associates Utility Customer satisfaction studies (Residential Electric, Residential Gas, Business Electric, Business Gas).

According to 2018 JD Power Residential Electric Customer Satisfaction Study, overall PSE customer service (including both online and phone service experiences) rose from the bottom of the third quartile nationally to mid-second quartile. Among the survey factors related to GTZ technology deployment, the customer satisfaction gains included:

- improving to first quartile in promptness of telephone answering (from third quartile);
- improving to second quartile in ease of website navigation (from fourth quartile);
- improving to second quartile in timeliness of online problem resolution (from fourth quartile); and
- improving to second quartile in providing outage information (from third quartile).

Of note, the JD Power research found that 93 percent of customers found PSE's outage map to be effective in communicating key information.

Q. Was improvement of customer experience an objective of GTZ?

A. The customer experience improvements from PSE's GTZ and related technology investments are aligned with JD Power research findings that customers strongly prefer self-service and proactive notifications instead of telephone and traditional mail, including: 1) customer preference for outage information via text notifications, email notifications or using mobile app versus contacting the utility by phone; 2) customer preference for using self-service, electronic platforms for bill payment versus traditional mail or telephone; and 3) customer preference for proactive billing and payment notifications for due dates, payments received and unusual usage.

Q. What additional features of the GTZ initiative are being implemented by PSE and will be addressed in future cases?

A. The GTZ program is a multiyear initiative comprised of many different projects linked under one umbrella. Looking beyond what has been put in service for this filing, the GTZ program will deliver on significant customer transformation projects from July 2018 through 2021. In that timeframe we will:

- Deliver a completely new web platform that consists of new technology infrastructure, an improved user experience with a new customer preference

center, and an integrated campaign management feature tied to a new communication gateway to drive proactive communications to customers.

- Deliver on a number of IVR improvements that transform the experience for those customers who elect to call. In this area we will deliver a new modularized IVR system introducing a dynamically routed experience for customers, simplify call routing within the IVR and add new self-service options for customers to choose from.
- Within the IVR we will deliver new technology to help categorize calls and improve customer service quality.
- Introduce new technology to enable a visual integrated voice response experience that will allow customers the ability to receive a prompt on their mobile device to complete a transaction if they elect to do so.
- Invest further in customer facing applications to provide a 360-degree view of customer interactions and implement new capabilities that leverage data analytics to help us further optimize our technology based on customer behavior and improve customer segmentation and campaign management.
- Deliver to our customers a new mobile application that will allow for a more convenient mobile experience and include many of the self-service transactional capabilities our customers are seeking.
- Invest in improving our field operations through the roll out of integrated work management to various PSE business units. The investment in this automation will improve our operational efficiency, integrate our technology

providing greater transparency to customers, and ultimately improve our ability make and keep commitments to our customers for work they schedule with us.

- Deliver on multiple projects directed at improving the customer billing and payment experience through the life of the GTZ program. This includes investments in updating PSE payment options for customers, standardizing non-consumption bills, improving collections cycle performance and our approach to distributing refunds to customers. Projects will focus on improving the experience for customers seeking energy assistance funds and the implementation of remote disconnect and reconnect capabilities.

Q. What is the cost of the GTZ initiative that PSE seeks to recover in this case?

A. PSE seeks to recover $19,644,870 associated with GTZ investments placed in service since the 2017 general rate case.

Q. How do the costs compare to the estimated costs?

A. The overall program cost estimates for the projects put in service for this filing were within a reasonable variance of three percent of the costs PSE seeks to recover.

Q. How did PSE manage the GTZ initiative and its costs?

A. PSE has formal Program/Project Management practices that govern GTZ projects. The System Development Life Cycle includes phase gates, where required deliverables are audited for compliance with IT Project Management

Organization ("PMO") practices. The GTZ program complied with these practices and successfully passed its phase gate audits. Financials were strictly controlled in accordance with IT PMO practices and were updated and reviewed monthly.

Q. Did PSE keep management informed during the course of the GTZ initiative?

A. The governance structure includes an Executive Steering Committee, a project Steering Committee, and leadership teams. Together these teams participate in regular meetings to monitor status, key decisions, risk mitigations, and review and approve program costs and changes. In addition, the GTZ program presented periodic updates to the Board of Directors on program progress.

Q. Were there any material changes that affected the GTZ scope, schedule or budget?

A. Yes, there were some material changes that affected the GTZ scope, schedule, and budget for the projects put in service during this filing period. Some projects saw an increase in scope from the original initiation estimate in order to capture additional business value that was identified through the phase gate process. However, as a program, we were able to manage cost increases through the use of program contingency funds and offsetting underruns in other parts of the program.

IV. DATA CENTER AND DISASTER RECOVER PROGRAM

Q. Please describe PSE's DCDR program

A. The DCDR Program is a four-year effort to mitigate a significant risk to critical IT systems that are essential to safely and securely provide gas and electricity to our customers. There are two components to the program, one focusing on the data center facilities and the other on disaster recovery capabilities. Prior to building the two new modular data centers, PSE had two sub-optimal data centers, one in Bothell and one in Bellevue, located in previously-leased office space that was not specifically designed to house a significant amount of IT equipment. Each location has insufficient power capacity, redundancy, and cooling capabilities, and neither facility is able to support PSE's growing IT needs. Additionally, the facilities are located 12 miles apart on the same seismic fault, increasing the probability of both being affected by a seismic event. The Bothell location is also located in a flood plain, and the data center is on the second floor of the office building causing structural concerns due to the weight of the expanded IT equipment. Bothell has experienced two significant outages directly attributed to the deficiencies noted above, causing significant impact to PSE's ability to operate. During these outages, PSE was forced to revert to manual (paper) processes to answer customer calls, which negatively affected SQI 5. The Load Office also ran on manual processes increasing risk to field operations.

The second component of the DCDR program focuses on improving disaster recovery "DR" capabilities for PSE's critical and important applications and

systems. Of the 51 critical systems running in the data centers, 19 (roughly 40 percent) did not have DR capabilities. The impacts to PSE of not being able to run these systems would be broad and significant.

Q. What alternatives did PSE consider?

A. PSE considered four alternatives to the final decision to build two new modular data centers.

1. Maintain the status quo;
2. Fortify existing data centers;
3. Co-locate (lease) both of PSE's data centers with another partner; and
4. Co-locate one (lease) of PSE's data centers with another partner.

After an extensive review of these options, including a total cost (20 year) analysis, risk to the company/customers of not controlling critical systems, and the inability to ensure compliance with NERC/CIP assets, the decision was made to build two modular data centers, with full redundancy, 80 miles apart, one located in western Washington near corporate headquarters, the other located in eastern Washington on PSE property. This approach provided the optimal solution to mitigate the seismic risk and the facility risk and to provide the security and resiliency required for business continuity, disaster recovery, and NERC-CIP compliance.

Q. Are the new data centers completed and in service?

A. Yes. Both data centers are fully operational. The application migration and decommissioning activities are still in progress; however as of June 30, 2018, all critical Tier 1 systems have been successfully migrated to the new facilities and disaster recovery capabilities have been tested and validated. All redundant network and telecommunications paths are in place and fully operational. This is a significant step in reducing the entity risk to the company. The program is roughly 95 percent complete and is on track to fully migrate all applications to the new facilities by the end of 2018.

Q. What was the cost of the data center and disaster recovery program?

A. The costs included in this filing are $65.2 million for the following costs:

1. Selection, facility construction: $33,226,550; and
2. Infrastructure hardware build: $31,217,343.

Cost recovery for application migration and decommissioning of old data centers will be included in a future filing.

Q. How did the actual cost compare to the estimated cost?

A. This request in this filing is limited to the facility selection, facility construction, and infrastructure build costs, which were estimated at $64,322,000 with an actual cost of $65,217,343.

Q. Did PSE keep management informed during the course of the project?

A. Yes. The governance structure included involvement by an executive steering committee and a project-level steering committee made up of leaders across IT. Together these teams participated in project oversight, key decision making, risk mitigations, and approval of costs and changes. The DCDR program was also reviewed, approved and supported by the Officers and Board of Directors, who stressed the importance and urgency of quickly mitigating the risk to the company.

Q. Were there any material changes that affected the project scope, schedule or budget?

A. While there were no major changes to scope, schedule or budget, there was a significant change that introduced risk that was successfully mitigated. In late 2017, we lost our initial location for the eastern data center, due to risk pertaining to a conservation easement at our Wild Horse Facility. The decision was made not to build on that location. That change contributed to a loss of eight weeks on our overall project schedule. Due to parallel pathing work streams, working extended hours and removing all schedule slack, we were able to meet the original delivery date for facility commissioning with minimal financial impact.

V. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.