EXH. MLV-1T
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: MICHELLE L. VARGO

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-240004** **Docket UG-240005**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

MICHELLE L. VARGO

ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 15, 2024

PUGET SOUND ENERGY

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I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy.

A. My name is Michelle L. Vargo, and my business address is P.O. Box 97034, Bellevue, Washington 98009-9734. I am employed by Puget Sound Energy ("PSE") as Senior Vice President, Energy Operations.

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

A. Yes, I have. Please see Exh. MLV-2.

Q. What are your duties as Senior Vice President, Energy Operations for PSE?

A. As Senior Vice President, Energy Operations, I am responsible for PSE's electric and gas operations, final engineering and construction of customer and system work, system maintenance, supply chain, fleet, and facilities.

Q. What is the purpose of this prefiled direct testimony?

A. The purpose of my prefiled direct testimony is to explain why the Energy Operations investments and expenditures PSE is proposing in this multiyear rate

plan support PSE's fundamental purpose to provide safe and reliable energy service to customers while also building the energy Delivery System of the future.

Section II of my testimony introduces PSE's Energy Operations department and provides a high-level overview of PSE's service territory, PSE's gas and electric Delivery System, and how Energy Operations interacts with other organizations within PSE. This section also outlines some of the challenges and regional changes that impact how PSE adjusts operations to provide safe, reliable, and clean energy to customers. Section III describes specific Energy Operations' investments planned for the multiyear rate plan aimed at providing safe, reliable, and clean energy to customers. Finally, section IV discusses how Energy Operations is incorporating equity into the services provided and work performed.

II. PSE'S ENERGY OPERATIONS OVERVIEW

A. Energy Operations Organization Overview

Q. What is PSE's Energy Operations organization?

A. PSE's Energy Operations organization is PSE's 'boots on the ground' in constructing, maintaining, and repairing the Delivery System and responding to Delivery System emergencies. PSE's Energy Operations' philosophy is aimed at providing energy delivery service that

- is safe for customers, the public, and PSE's employees;
- maintains the reliability of PSE's electric grid so it can continue to provide core services to customers while facilitating PSE's transition to clean energy;

- preserves the safe and efficient operation of its natural gas system while supporting the transition to clean energy; and

- provides service to customers equitably.

Each of these objectives is addressed in more detail below.

Q. Please describe the Energy Operations organization.

A. Energy Operations consists of over 1,500 employees and six departments that work together to execute core energy delivery services, including:

- **Electric Operations.** Responsible for maintaining and constructing the electric Delivery System, managing the central control center, and restoring outages.

- **Gas Operations.** Responsible for maintaining and constructing the natural gas Delivery System, responding to emergent conditions, and controlling/monitoring the gas system.

- **Field Engineering.** Responsible for implementation of projects from Delivery System planning and creating detailed designs and follow-up documentation to reflect system changes.

- **Field Operations.** Responds to customer requests for service or upgrades. Field Operations works in concert with the Electric Operations and Gas Operations teams as well as Field Engineering.

- **Project Delivery.** Responsible for executing on and managing PSE's planned programs and large projects.

- **Shared Services.** Provides contract management oversight, supply chain, facilities, fleets, and data metrics.

Roque B. Bamba, Director of Project Delivery, and Ryan Murphy, Director of Electric Operations, are two witnesses in this case that work in Energy Operations. Please see the Prefiled Direct Testimony of Roque B. Bamba, Exh. RBB-1T, which describes PSE's processes for executing on planned

programs and projects and presents certain projects that will be in-service during the multiyear rate plan. Please see the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T, which describes PSE's Delivery System investments for wildfire risk mitigation during the multiyear rate plan that will be included in a proposed Wildfire Prevention Tracker.

B. Overview of PSE's Electric and Gas Systems

Q. Please provide a high level description of PSE's electric system.

A. PSE delivers electricity to load across 26,438 miles of transmission and distribution system supported by 353 transmission and distribution substations. The electric grid integrates electric resources through approximately 12,000 net metered solar customers and will support 102 MW of distributed energy resources through the multiyear rate plan period by proactive modernization and non-wire alternatives that enable a cleaner energy supply. While some of PSE's electric infrastructure currently in service is over 80 years old, PSE maximizes and leverages assets beyond their expected life cycles as a result of focused maintenance practices.

Q. Please provide a high level description of PSE's gas system.

A. PSE delivers natural gas through approximately 26,000 miles of pipeline (mains and services) supported by 553 pressure regulating stations. On average, the gas supply integrates 1,340,211 decatherms (MMBTU) of renewable natural gas annually. On cold days, PSE augments its natural gas delivery with compressed

and liquefied natural gas and manually adjusts valves and set points to optimize pipeline operations. Some of PSE's gas infrastructure currently in service is over 50 years old; it is managed through robust continuing surveillance processes and risk management requirements and techniques.

C. PSE's Service Territory Presents Unique Challenges and Opportunities

Q. Please describe PSE's service territory that Energy Operations serves.

A. PSE provides service to over 850,000 natural gas and approximately 1.2 million electric customers in partially overlapping service territories. PSE's total service territory covers approximately 6,000 square miles in the Puget Sound region of western Washington, stretching to Kittitas County across the Cascade Mountain Range to the east, around the Puget Sound including Thurston, Kitsap, and Island Counties to the west, Whatcom County up to the Canadian/U.S. border in the north, to parts of Lewis County to the south.

Q. Does PSE's service territory present any demographic challenges for Energy Operations?

A. Yes, it does. PSE's service territory is made up of a diverse customer base. PSE's service territory includes customers in cities such as Seattle, Olympia, and Bellevue, as well as small towns such as Index, Black Diamond, and Oak Harbor. Customers located in urban areas have different needs, infrastructure, and resources when compared to suburban and rural areas. Additionally, each jurisdiction in which PSE works has its own set of procedures and codes related to

right-of-way access, which impacts the timing of construction and maintenance work. These codes and procedures also dictate surface restoration requirements or mitigation measures—all of which impact cost. Energy Operations must be able to serve all of these areas despite any obstacles these jurisdictions may pose.

Other demographic challenges include:

- The rapid adoption of electric vehicles and other electric transportation in Washington, such as shipping, is placing significant demands on PSE's electric infrastructure and the work needed to build and maintain that infrastructure.
- The high number of customers still working from home post-COVID-19[1] which has created constraints on scheduling planned system outages and amplified the attention on system outages.
- The high cost of living. In 2023, the Seattle area ranked as the ninth-highest overall cost of living and residents experienced an increase of 46 percent cost of living while compared to the national average.[2] This puts a significant strain on customers. At the same time, wages for employees continue to rise, which puts a strain on PSE's cost of operations. For example, the pay for linesman in Washington is one of the highest in the nation.[3]

Q. Does PSE's service territory present any geographic challenges for Energy Operations?

A. Yes, it does. The geography of PSE's service territory is diverse and varied. The service territory terrain includes the urban and densely populated areas of the

[1] *See* M. Santos, *Remote Work in Seattle Remains Above U.S. Average*, Sep. 19, 2023, https://www.axios.com/local/seattle/2023/09/19/remote-work-jobs-seattle-wfh-statistics.

[2] *See* G. Balk, *Despite Cooling Inflation, Many Costs Rising for Seattle Residents*, Dec. 1, 2023, https://www.seattletimes.com/seattle-news/data/despite-cooling-inflation-many-costs-rising-for-seattle-residents/.

[3] Lineman Central, *Highest Paying States For Lineman in 2024*, https://www.linemancentral.com/lineman-pay-by-state.

Puget Sound region, coastal areas such as the islands in Island County, the rugged Cascade Mountains, agricultural farmlands, and the more rural and less populated areas in Whatcom and Kittitas Counties. This geographic diversity mandates different types of Delivery System infrastructure (such as the unique need for submersible cables); different maintenance and service needs (such as vegetation management in heavily forested areas or transmission system maintenance in remote, difficult to reach mountain areas); and different risks and dangers, such as wind, snow, and ice events, the growing risk of wildfire, and the potential for a catastrophic seismic event. The work performed by Energy Operations to facilitate energy delivery service must account for and incorporate the various contingencies of its service territory so energy is provided to customers safely and reliably.

Q. How has climate change and the increase of wildfire in PSE's service territory affected Energy Operations?

A. Energy Operations is actively working to mitigate the risks and impacts to customers caused by climate change and an increased risk of wildfire in PSE's service territory.

As the frequency and severity of climate change-related events continues, PSE must maintain the safety and reliability of its utility service. Extreme weather events—such as storm events and associated flooding, snow and avalanche dangers, cold snaps, and heat waves—can raise safety concerns for PSE's customer base, employees, and the public at large as well as damage

infrastructure. As these events continue to occur, PSE must continue to invest and implement system upgrades. Please see the Prefiled Direct Testimony of David J. Landers, Exh. DJL-1T, for a discussion of PSE's system upgrade needs.

Traditionally, western Washington had a relatively low wildfire risk compared to other areas such as the more arid land east of the Cascade Mountains. That said, fires can occur anywhere and the risk of wildfires in PSE's service territory is growing. For the past several years, PSE has been taking prudent steps to address and mitigate this risk. However, the recent catastrophic wildfire events in the western U.S. have heightened the concern and caused PSE to expand its wildfire mitigation program. Moreover, recent wildfires in other parts of the United States that have historically not had wildfires have contributed to PSE's assessment of this growing risk and the expansion of PSE's wildfire mitigation program. Please see the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T, for a discussion of PSE's response to wildfire risk.

D. Energy Operations Works in Tandem with Systems Planning

Q. How does Energy Operations interact with PSE's Systems Planning organization?

A. The Energy Operations and System Planning organizations work closely together. System Planning, led by David Landers, Director of System Planning, operates within PSE's Clean Energy Strategy and Planning organization, which leads

PSE's efforts and plans to transition to clean energy. Energy Operations is responsible for executing Delivery System plans prepared by System Planning.

My testimony does not address in detail the specific investments proposed in the multiyear rate plan nor the planning process used to develop the portfolio. Instead, this testimony focuses on the operational drivers and objectives that the planning process considers in determining investment needs and the role Energy Operations plays in performing this work. Please see the Prefiled Direct Testimony of Roque B. Bamba, Exh. RBB-1T, and the Prefiled Direct Testimony of David J. Landers, Exh. DJL-1T, for a further discussion of the interaction between the Energy Operations and System Planning organizations, and the Energy Operations investments proposed in this case.

In addition, as PSE continues to integrate energy equity into its services, Energy Operations also works closely with PSE's Energy Equity group, led by Troy Hutson, Director of Energy Equity. Please see the Prefiled Direct Testimony of Troy A. Hudson, Exh. TAH-1T, for a discussion of PSE's overarching progress toward incorporating energy equity into the business. Section IV, below, discusses the integration of energy equity into Energy Operations activities.

Q. What Energy Operations investments are being proposed in this case?

A. As stated above, Energy Operations implements plans developed by System Planning. The Prefiled Direct Testimony of David J. Landers, Exh. DJL-1T, describes the Delivery System investments planned for this multiyear rate plan.

Q. In brief, describe how Energy Operations executes Delivery System plans and the challenges associated with such implementation.

A. At a high level, Energy Operations and System Planning collaborate to identify, design, prioritize, and execute planned work by System Planning. The execution involves both project and program management to deliver plans within the defined scope, schedule, and budget. Energy Operations implements both projects (major projects as well as routine work such as customer service additions) and programs (coordinated or complex projects). Energy Operations follows industry practices based on PSE's Infrastructure Project Lifecycle Phase/Gate and Infrastructure Program Management Models. For a more discussion of how PSE organizes, manages, and executes work, please see the Prefiled Direct Testimony of Roque B. Bamba, Exh. RBB-1T.

While program and project implementation is a core function of Energy Operations, execution of planned work does not occur in a vacuum. For every new project or program that is developed, Energy Operations must allocate resources to that work. At the same time, however, Energy Operations must also maintain PSE's high standards of safety and reliability. This can result in cascading resource needs. For example, in the context of PSE's Virtual Power Plant and other areas of grid modification, Energy Operations must expand its control center (digital hub) to provide monitoring, staffing, and additional technology related to cloud-based utility service. In doing so, staffing must be allocated to these new roles. These employees need to be trained and those

backfilling existing roles also require additional training. Additionally, for any new program, there are undoubtedly issues to be worked out and lessons to be learned. Accordingly, each project or program requires significant investment in staffing for enhancing its capacity and knowledge base.

III. PSE'S ENERGY OPERATIONS FACILITATES SAFE, RELIABLE, CLEAN, AND EQUITABLE ENERGY SERVICE FOR CUSTOMERS

A. PSE's Energy Operations Spending in the Multiyear Rate Plan Prioritizes Customer, Public, and Employee Safety

Q. Please elaborate on PSE's priority of customer, public, and employee safety.

A. PSE's paramount priority is, and will remain, the safe operation of its electric and gas systems. Safety is designed and integrated into all of PSE's work, from prioritizing safety in Delivery System Planning processes and decisions, to design and construction standards that embed safety margins to keep workers and the public safe, to operational practices that are deployed every day.

Q. Please provide an overview of how Energy Operations supports customer and public safety.

A. Energy Operations supports customer and public safety in the following areas: emergency repairs, emergency response, natural gas safety, wildfire safety, systems mapping, pipeline safety, cybersecurity, and safety of physical assets. David Landers' exhibit, Exh. DJL-3, describes the programmatic work performed by Energy Operations to improve and maintain customer and public safety. Much

of this work is aimed at preventative work to avoid harm to customers and the public. Energy Operations programs that support customer and public safety include the following:

Emergency repairs. Emergency repairs, or "corrective maintenance," include the repair and replacement of failed or compromised infrastructure, such as replacing a pole that has been damaged or at risk of imminent failure based on inspection could occur; repairing storm damage; repairing a meter set that has been damaged; or repairing a leak that requires pipe replacement. The core objectives of this work and investments are to respond quickly to resolve immediate and imminent safety concerns and return the infrastructure to sound function for the health of the system. Emergency repairs are the highest priority for PSE. They have priority over discretionary and other non-discretionary work.

Emergency response. As discussed in more detail below, PSE maintains a 24-hour response to gas and electric emergencies that are reported by customers and the public or observed through PSE monitoring. For major storms and other natural disasters, PSE maintains a comprehensive and robust modified Incident Command Structure that scales to the magnitude and specific nature of each emergency. PSE trains employees on their emergency response roles and practices emergency response procedures through mock emergency exercises. Additionally, PSE participates in, and is continuously improving and adopting best practices in emergency preparation and response.

Wildfire safety. As noted above, wildfire risk poses challenges to PSE, its employees, and the public safety, as well as PSE's efforts to maintain reliable energy to its customers. I address wildfire safety in more detail below.

Systems mapping. A critical component to PSE's commitment to safety is systems mapping. As mentioned above, improving the timeliness and detail of PSE's systems mapping requires an investment in GIS and GPS-enabled real-time mapping technology. For example, Materials Tracking & Traceability can be used to help manage recalls, inventory, and asset management. Therefore, if a specific type of equipment is compromised in one location, Energy Operations can quickly and readily identify where in PSE's service territory that equipment is located and monitor, repair, or replace that equipment as necessary. Work related to developing and maintaining of advanced mapping capabilities will only increase, thereby requiring additional resources from the Energy Operations organization.

Cybersecurity. As more and more of PSE's operations require cloud-based computing power, PSE must enhance its cybersecurity to protect its assets, operations, and customers. This will also require Energy Operations to allocate employees and provide additional training on cybersecurity.

Pipeline safety. With the enactment of the PIPES Act and the PHMSA Mega Rule,[4] PSE is also pursuing advanced methane leak detection tools to increase environmental safety and PSE continues to enhance practices to reduce methane

[4] Please see the Prefiled Direct Testimony of David J. Landers, Exh. DJL-1T.

emissions. For example, PSE is shifting towards using recompression when pipeline pressure must be reduced during construction activities and is moving away from venting methane to the atmosphere. In accordance with state and federal pipeline safety regulations, PSE requires that gas operations employees secure and maintain the necessary operator qualifications. This is accomplished through formal training and evaluation. Operator qualifications are a critical component of pipeline safety, which ultimately is about customer and public safety. PSE has been audited annually for pipeline safety by the Commission's Pipeline Safety Staff. Over the past five years, PSE has passed these detailed audits with no violations. PSE prioritizing meeting pipeline safety regulations.

PSE also focuses on protecting natural gas infrastructure from damage. Working safely around natural gas pipelines and underground electrical equipment is critically important. PSE actively promotes Washington State's "Call 811 Before You Dig" service and provides the construction industry with resources through direct access to PSE damage prevention representatives. PSE also builds natural gas safety awareness throughout its customer base and with the public by distributing safety information regarding natural gas leaks and odors, distributing safety fliers to new gas customers, and informing the public about sewer cross bore risks.

Safety of assets and infrastructure. PSE has had to increase its spending on security to prevent vandalism, trespassing, and break-ins to PSE's vehicles, rights-of-way, service centers, and substations, as well as providing employees

safe access to system equipment located in public rights of way. In recent years, PSE, the Bonneville Power Administration, Portland General Electric, Tacoma Power, the Cowlitz County Public Utility District, and utilities in other states, have been subject to attacks at their electrical substations.[5] These attacks can disrupt power for days and divert resources away from PSE's critical operations. PSE must be vigilant about relentlessly protecting the physical security of critical infrastructure.

PSE also responds to required relocation of its assets that are in conflict with municipal infrastructure installation, replacement, or improvement projects so that construction can occur safely. There are both benefits and costs associated with PSE infrastructure occupying public rights of way. Such projects provide significant benefit to the general public. Relocation of PSE facilities, when they are in conflict with municipal projects, are primarily for safety and secondarily for accommodating civil design requirements, particularly when PSE is required to relocate underground facilities.

Funding to support these essential programs are included in PSE's proposed multiyear rate plan. Please see David Landers' exhibit Exh. DJL-3 for a discussion of customer and public safety investments.

[5] *See, e.g.*, C. Wilson & J. Ryan, *String of Electrical Grid Attacks in Pacific Northwest is Unsolved*, Dec. 8, 2022, https://www.opb.org/article/2022/12/08/string-of-electrical-grid-attacks-in-pacific-northwest-are-unsolved/.

Q. How does Energy Operations support customer and/or public safety as technology changes?

A. Public safety is considered in PSE's system designs and field procedures. Changing technology such as electric vehicles, roof top storage, battery systems, and microgrids make this more challenging. Resources are required to clearly communicate with all of the individual jurisdictions granting permits, electricians, and vendors/contractors installing equipment to ensure energy first responders are able to stabilize a site and ultimately restore services timely and safely. PSE must also work with other first responders so they understand how to protect themselves from these new energy hazards. As the service territory adopts more of these energy solutions, additional training, planning, and coordination will be required.

Q. How does PSE's proposed Energy Operations spending in the multiyear rate plan promote employee safety?

A. The ability to provide safe energy service starts with employee safety. Energy delivery work includes some of the most dangerous occupations in the United States, such as vegetation management, high voltage work, gas pipeline work, and the transportation of large equipment. PSE adheres to industry standards, training, and required compliance programs for employee safety. Compliance programs are in constant evolution and the work to maintain compliance is prioritized. Ongoing investment in this area is critical so PSE stays current regarding best practices, changing standards, and new technologies.

Training is an essential part of employee safety. As technology changes and new standards are imposed by regulatory agencies, PSE must expend time and resources to train its employees. The demographics of PSE's employees are changing. As more tenured employees are retiring, newer employees must be able to step into new and more advanced roles. However, these newer employees often require additional training to be able to take on new positions.

Climate change has also impacted employee safety. As the frequency of extreme weather events increase, so does the need for new tools and processes to protect the safety of employees. This can involve limiting work during extreme temperature and providing new gear to protect employees. For example, PSE adjusted operations to protect workers against heat and wildfire as per Washington Department of State Labor and Industries guidance.[6] Minimizing employee exposure in the future will include more automated switching or system sectionalizing so services can be maintained or restored during events. These efforts are costly and also require additional training.

Because the majority of Energy Operations employees are deployed into the field, they must be prepared to interact with the public in a safe manner. Employees are often confronted with dangerous situations, such as unauthorized encampments on and around PSE equipment as well as drug paraphernalia disposed of around

[6] https://www.lni.wa.gov/safety-health/safety-training-materials/workshops-events/beheatsmart.

natural gas and electric facilities. Outside resources are required to escort and protect employees, and clean in and around PSE equipment, as necessary.

Finally, employee safety is more than the physical safety of employees. It also encompasses the mental of health of employees. Some aspects of delivering energy to customers are inherently dangerous and stressful. Post-pandemic, PSE has also focused on mental health for employees so they can be more present for customers and co-workers. PSE also has programs in place that help employees with physically demanding positions preemptively take care of their bodies as well as a systemic approach to identifying high risk field work or near miss trends.

Q. Please provide an overview of PSE's Emergency Response Operations.

A. As noted above, PSE maintains a robust 24-hour response to gas and electric emergencies that are reported by customers and the public or observed through PSE monitoring. As discussed in the Prefiled Direct Testimony of David J. Landers, Exh. DJL-1T and Exh. DJL-3, PSE has millions of dollars in forecasted investments for public safety and emergency response. In 2023, PSE maintained an average response time of 32.6 minutes or less for natural gas emergencies, which is under the SQI threshold of 55 minutes. This response time is accomplished through collaboration between PSE's Call Center and Gas System Operations team, who is responsible for dispatching and coordinating resources in an emergency. On the electric side, PSE strives to maintain an average response

time for electric service incidents of 55 minutes. Please see Exh. DJL-3 for trends in emergency repair and benefits from the investments.

For major storms and other natural disasters, PSE maintains a comprehensive and robust modified Incident Command Structure that scales to the magnitude and specific nature of each emergency. Every year, PSE trains employees on their emergency response roles and practices emergency response procedures through mock emergency exercises. Additionally, PSE participates in, and is continuously improving and adopting best practices in emergency preparation and response. PSE participates with the American Gas Association and the Edison Electric Institute to share experiences and formalize best practices.

Finally, PSE coordinates with electric and gas emergency personnel through participation in mutual assistance programs from other companies and contractors should the need arise. Mutual assistance and the use of contract resources allows PSE to temporarily—and cost-effectively—scale its resources during an emergency event. PSE also trains firefighters who respond to fires and gas leaks. This coordination work is done through annual training via both in-person field and tabletop exercises.

Q. What are some of the emerging challenges faced by Energy Operations with regard to safety?

A. Some of the challenges PSE faces with regard to public safety are due to the challenges associated with PSE's service territory such as population growth,

state and municipal road and transportation construction, traffic density, and the unhoused population. Moreover, demographic diversity makes it challenging for PSE to respond to emergencies. Some communities are simply not equipped with the same resources for training and responding to emergencies and need to heavily rely on PSE for its emergency preparedness capabilities.

The different terrains in PSE's service territory create varying levels of difficulty in managing emergency response. For example, WSDOT road closures due to avalanche danger makes it difficult for PSE employees to respond to power outages; different terrain has different weather-related risks such as extreme flooding events in Skagit County and the Nisqually Valley, wildfires in areas east of the Cascade Mountains, and common high wind impacts in Island and Kitsap County.

Additional challenges include changes in safety regulations. New requirements, whether at the federal, state, or local level, can create challenges if PSE is unable to adequately invest in or deploy resources to meet these requirements, maintain existing operations, and transition to cleaner energy.

B. PSE's Energy Operations Spending in the Multiyear Rate Plan Prioritizes Wildfire Risk Tracking and Mitigation

Q. Please provide an overview of PSE's wildfire mitigation efforts.

A. PSE remains vigilant regarding wildfire risk and has a formal wildfire mitigation program that it began developing in late 2018. Ryan Murphy manages PSE's

Wildfire Risk Mitigation department, who prepares the Wildfire Mitigation and Response Plan. PSE will need to continue to make long-term investments in programs and infrastructure to mitigate wildfire risks and impacts on the Delivery System. Please see the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T.

Q. What is the Wildfire Mitigation Response Plan?

A. As stated in the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T, PSE's Wildfire Mitigation and Response Plan documents PSE's strategies, programs, procedures, and specific actions to respond to and mitigate the risk of wildfire. The Wildfire Mitigation and Response Plan incorporates best practice models from risk management, operations, emergency management, communications, and training. To facilitate PSE's wildfire-specific investments, PSE is proposing a Wildfire Prevention Tracker to create greater visibility, focus, transparency, and accounting treatment for its wildfire investments. PSE's priority is the safety of the communities and customers that PSE serves and of the personnel that serve them.

Q. How do situational awareness investments mitigate wildfire risk?

A. PSE has worked with a consultant to help develop a real-time situational awareness tool that depicts real-time fire behavior risks in PSE's service territory. This tool is known as "Fire Risk" and will provide daily situational awareness of elevated weather and fire behavior risks. PSE plans to supplement "Fire Risk" with field technology to improve PSE's real-time situational awareness including

PSE-deployed weather stations and the installation of continuously monitored, artificial intelligence, high-definition cameras that detect smoke. PSE is working to complete the first round of installations of weather stations and cameras prior to the start of 2024 fire season. Please see the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T, for additional information.

Q. What other investments is PSE making to mitigate wildfire risk?

A. PSE is making fault reduction and fault protection investments. Fault reduction investments are investments in the infrastructure that reduce the likelihood of a fault on an electrical circuit. These include upgrading overhead wires, undergrounding wires, patrolling before fire season, replacing poles, vegetation management, and vigilant monitoring of high-risk transmission lines. Fault protection investments are intended to prevent utility equipment from igniting dry grass or vegetation during fire weather events by reducing the duration and extent of fault energy during a failure occurrence. Fault protection investments include grid automation and substation Supervisory Control and Data Acquisition ("SCADA"). Please see Ryan Murphy's testimony, Exh. RM-1T, for additional information.

Q. What challenges does PSE face with regard to wildfire risk?

A. Wildfire challenges include implementing comprehensive mitigation strategies, addressing vegetation management outside rights of way, access to capital, and eroding insurance markets. Given the rise in wildfire events, public scrutiny of

utility operations involvement in fires, and the potential liabilities utilities face related to these fires, insurance premiums have skyrocketed. These factors have also made it challenging to access wildfire related insurance coverage. Please Exh. RM-1T for a more detailed discussion of PSE's challenges in mitigating wildfire risk, and the Prefiled Direct Testimony of Daniel A. Doyle, Exh. DAD-1CT, for a discussion of the escalating cost of PSE's insurance resulting from increased wildfire risk.

C. PSE's Energy Operations Spending in the Multiyear Rate Plan Will Improve Grid Reliability While Facilitating the Transition to Clean Energy

Q. Describe PSE's obligation to provide reliable electric energy service.

A. PSE has a basic obligation to provide reliable electric service to all customers in its service territory. However, the transition to clean energy and the proliferation of distributed energy resources and electric vehicles, for example, requires that the modern grid be capable of both performing its historic functions while keeping pace with the new demands on its system. PSE's grid reliability and modernization planning is described in the Prefiled Direct Testimony of David J. Landers, Exh. DJL-1T, Exh. DJL-3, and Exh. DJL-5. Providing reliable service to customers is of paramount importance to PSE, and PSE must continue to adequately spend to maintain adequate electric reliability as proposed in the multiyear rate plan.

Q. What is some of the key electric reliability work planned during the multiyear rate plan that will be performed by Energy Operations?

A. Some of the key electric reliability work planned during the multiyear rate plan includes programmatic investments, capital investments, specific reliability projects, as well as data use and monitoring. The capital spending and increased operations and maintenance spending requested in the multiyear rate plan are necessary to carry out the work outlined below.

Programmatic Investments. PSE's programmatic investments performed by the Energy Operations organization focuses on the proactive repair and/or replacement of infrastructure that is in poor health based on inspections or diagnostics. These programs include PSE's substation reliability program to maintain aging substations, its pole replacement program to maintain the structural integrity of PSE's overhead electric system, and its mobile substation maintenance program which is critical during outage events to act as a temporary replacement for affected equipment. Please see the Prefiled Direct Testimony of David J. Landers Exh. DJL-1T, Exh. DJL-3, and Exh. DJL-5.

Capital Investments. PSE's planned capital investments and associated operations and maintenance spend to improve electric reliability during the multiyear rate plan includes automation, cable remediation, circuit modernization, electric system upgrades, submarine cable improvements, and conservation voltage reduction. These projects and programs are executed by the Energy Operations organization and have a direct impact on several corporate

performance metrics including SQI #3 (System Average Interruption Duration Index (SAIDI)); SQI #4 (System Average Interruption Frequency Index (SAIFI)); failure to restore electric service within 24 hours of an outage during non-major storms; failure to restore electric service within 120 hours of an outage; SQI #11 (Average electric safety response time); Customers Experiencing Multiple Interruptions (CEMI); and SQI #2 (complaints to the WUTC per 1,000 customers). Please see Exh. DJL-5.

Specific Reliability Projects. The Bainbridge Island project in Kitsap County and the Sedro-Wooley—Bellingham #4 115 kV project are two ongoing projects projected to be completed during the multiyear rate plan. These projects illustrate the types of important projects Energy Operations is perform to harden the grid and improve reliability in those areas, including while incorporating new clean energy technologies. The Bainbridge Island project in Kitsap County—an area with historic reliability challenges—involves constructing a new 115 kV transmission line with upgraded substations, rebuilding an existing transmission line, and the installation of a battery energy storage system and a distributed energy resource portfolio. The second project, the Sedro-Woolley – Bellingham #4 115 kV project, has been a multi-phase project that will rebuild and reconductor the existing 24-mile-long Sedro Woolley-Bellingham #4 115 kV line, and to replace/rebuild the pole structures to PSE's 115 kV configuration in the current corridor alignment, as well as rebuild the 12.5 kV underbuilt distribution. Both of these projects are emblematic of PSE's commitment to improve grid reliability for its customers. Please see the Prefiled

Direct Testimony of Roque B. Bamba, Exh. RBB-1T, for further details about these projects.

Additionally, there are two major backbone infrastructure projects identified by System Planning currently progressing through Initiation and Planning phases of PSE's project lifecycle process that are expected to enter Execution phase and be placed in-service during the multiyear rate plan. The Seabeck Area Reliability Project will benefit 4,700 customers that have historically experienced some of PSE's worst system performance by constructing a new underground feeder and switching options for improved reliability, capacity, and operational flexibility. The Greenwater Tap Reliability Project is a multi-phased project that will upgrade a 26-mile long radial 55 kV transmission line that originates from the Krain Corner 115 kV substation and serves multiple substations and several rural communities along its route, with the first phase anticipated to be placed in service during this multiyear rate plan. Please see Exh. DJL-7 for further details about these projects.

Data Monitoring. Energy Operations must monitor system data to better understand system constraints and performance issues as well as identify the root cause of issues. Specific monitoring programs include Advanced Metering Infrastructure ("AMI"), systems mapping, Dissolved Gas Analysis ("DGA"), and the Pole Inspection and Remediation Program. Please see Exh. RBB-1T, Exh. DJL-3 and Exh. DJL-5, for further details about these programs.

Q. What ongoing electric reliability work do you anticipate Energy Operations will need to continue to invest in going forward?

A. David Landers' testimony, Exh. DJL-1T, and his exhibits, describe PSE's ongoing programs to improve reliability and automate the grid. These projects include vegetation management, integration of information technology systems with operational technology systems ("IT/OT"), vendor diversification and onboarding, ADMS, GIS mapping, AMI data analytics, and SCADA.

PSE has a growing number of situational awareness tools to inform and enable responses to reliability concerns. With the implementation of ADMS, system operators will have access to field monitored data and up to date system topography and enables configuration so that they can manage concerns and maintenance in real time. Please see the Prefiled Direct Testimony of Brian E. Fellon, Exh. BEF-1CT, for a discussion of ADMS and IT/OT. Use of AMI data helps to address power quality issues in the field and inform storm response priorities. Please see the Prefiled Direct Testimony of Roque B. Bamba, Exh. RBB-1T. Dashboards showing red flag areas and wildfire risk help operators take action to promote safety and reliability. Please see the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T.

Energy Operations execution of the work considers construction related reliability impacts as well, with new tools supporting coordination of planned outages in a manner to minimize impact. Finally, investments in self-healing technology

means safety can be addressed immediately and outages are contained to the smallest area possible.

Q. What challenges does Energy Operations face in supporting PSE's electric reliability effort?

A. Energy Operations faces a variety of challenges in support of PSE's electric reliability efforts.

Growing costs. Materials and labor have become more expensive as supply chain constraints continue to persist. The cost of raw materials continues to rise while materials take longer to be available. For example, raw material cost for transformers have risen 60 to 70 percent on average since January 2020, while lead times for critical materials have also increased above 25 percent.[7] This increases construction costs while leading to project delays.

Coordination and staffing shortages. Energy Operations has limited resources due to a shortage of trade workers combined with an emerging need for different skills to support new bodies of work such as solar, batteries, and microgrids. Given these constraints, PSE is relying more on new employees and contractors, which complicates coordination.

Modernization. As the grid modernizes, manual equipment is replaced with digital equipment and there are more opportunities to automate equipment system

[7] K. Jacobs, *Supply Shortages and an Inflexible Market Give Rise to High Power Transformer Lead Times*, Nov. 22, 2023, https://www.woodmac.com/news/opinion/supply-shortages-and-an-inflexible-market-give-rise-to-high-power-transformer-lead-times/.

operations. Additionally, the use of two-way flow (energy flows to the distribution system from distributed energy resources), such as the Virtual Power Plant, creates new operational challenges. These include developing new operating standards, managing data, storage, and accessibility; it also requires new roles to monitor system data with tools such as ADMS, and training personnel with new skills to repair field equipment and install new technology.

System stability. As the area grows beyond first adopters of new technology to more general use by customers, PSE needs to expand capacity for integrating these evolving technologies while simultaneously increasing investments in capacity, reliability, and resiliency to enable clean energy transformation. PSE's grid investments over the multiyear rate plan will increasingly require planned outages, challenging field operations to make replacements or install new assets with the system still energized or "hot" in order to minimize impact on reliability. The increasing volume of work that must be concurrently performed on the Delivery System to achieve clean energy transformation goals, although being planned in a manner to minimize scheduled outages, will inherently impact PSE's reliability metrics. Therefore, as discussed and listed in Exh. DJL-1T, PSE is proposing modifications to the calculation methodology of two metrics, SQI #3 – SAIDI and SQI #4 – SAIFI.

System flexibility. Providing system flexibility through mapping, the Virtual Power Plant, and other operational technologies, is incredibly difficult with a lean and novice workforce.

Extreme weather. As noted above, extreme heat events in PSE's service territory continue to be on the rise, creating both the challenge of planning for peak load and having equipment operate at or above normal operating limits decreases the life of the equipment. Additionally, heat events have an impact on tree health leading to increased numbers of whole trees or branches falling into power lines and subsequently causing outages. PSE has experienced outages, service transformer failure, and also strain on Energy Operations field personnel who work outside to resolve these emergency conditions.

PSE's tools and workforce are in continual learning and transition, and grid reliability depends on a workforce that can respond in a new way.

Q. Please elaborate on the tension between electric reliability and climate legislation.

A. As PSE maintains and invests in system reliability, it must also invest in clean technologies to meet the requirements of the Clean Energy Transformation Act ("CETA")[8] and Climate Commitment Act ("CCA").[9] System Planning operates within PSE's Clean Energy Strategy and Planning organization. As explained above, Energy Operations is responsible for the execution of System Planning's programs and projects while simultaneously maintaining the reliability and safety that PSE's standards and customers demand. There is a growing tension between maintaining existing infrastructure reliability while installing or restructuring new

[8] Chapter 19.405 RCW.
[9] Chapter 70A.65 RCW.

equipment that meets CETA and the CCA's objectives. Additionally, more investments in cleaner technologies means a need to upgrade systems to increase capacity for these technologies.

Energy transitions require employees and resources that do not exist in a vacuum. Energy Operations is responsible for teaching and training employees how to interact with, maintain, and utilize these new technologies. These are the same employees who have the best understanding of existing technologies. PSE must invest in resources to avoid losing institutional knowledge and to maintain a capable workforce.

D. PSE's Energy Operations Spending in the Multiyear Rate Plan Maintains Gas Pipeline Reliability while Supporting the Clean Energy Transition

Q. Please describe PSE's obligation to provide reliable gas energy service.

A. Natural gas service is primarily driven by a customer's desire for gas due to its lower rates and/or the quality of cooking and heating performance. PSE has an obligation to serve customers requesting gas service in its service territory and maintain safe, adequate, and efficient service. This requires ongoing investments in Delivery System integrity and engineering, standards, procurement, and training organizations that support these investments and operations.

Q. What are some of the key gas reliability work to be performed by Energy Operations during the multiyear rate plan?

A. A detailed discussion of PSE's planned gas reliability work can be found in the David Landers' testimony and exhibits Exh. DJL-1T, Exh. DJL-3, and Exh. DJL-6. Highlights of some of the key work to be done is addressed below.

Gas Maintenance Program. The Gas Maintenance Program focuses on identifying pipeline safety risk and integrity management concerns in both the distribution and transmission systems and meeting increasing regulatory requirements related to pipeline safety. The program includes planned maintenance and proactive repair and replacement of higher risk infrastructure. The Gas Maintenance Program includes PSE's Pipeline Replacement Program, which together is aimed at inspecting, maintaining, and repairing PSE's gas distribution system.

Digital Monitoring Program. The Digital Monitoring Program will allow Energy Operations to implement modernized pipeline monitoring and response tools to provide faster identification of issues, provide real time monitoring and response, replace antiquated monitoring equipment, and meet Transportation Security Administration cybersecurity requirements.

Alternate Fuels Readiness Program. This program prepares the gas Delivery System for readiness to accept alternative fuels such as clean hydrogen and larger

amounts of renewable natural gas. This program reviews pipeline investments for compatibility with a decarbonized future energy supply.

Q. In what ongoing gas reliability work do you anticipate Energy Operations will need to continue to invest going forward?

A. Ongoing reliability work includes, but is not limited to, replacing existing assets that are prone to failure (i.e., aging infrastructure); pipeline integrity mitigation; pipeline modernization; meeting energy demands of constrained areas of the gas Delivery System; meeting safety standards imposed by local, state, and federal bodies; quality control; repair of damaged or leaking infrastructure; and patrols, inspections, and survey work. Please see Exh. DJL-1T and Exh. DJL-6.

Q. What challenges does Energy Operations face in supporting PSE's gas reliability efforts?

A. There are a variety of challenges that PSE faces regarding gas reliability. PSE must continue to maintain existing infrastructure for safety and customer satisfaction. At the same time, PSE must also invest in new technologies, operating practices, and infrastructure to support energy transition. Similar to the challenges faced in maintaining electric reliability, this requires employees or vendors with expertise and experience. However, given the energy transition, employees and vendors with experience and interest related to gas and pipeline maintenance are becoming increasingly scarce. There are also challenges associated with opposition to gas that can make permitting maintenance activities

increasingly difficult. Lastly, there are important safety considerations with gas, such as pipeline safety, safety of employees, damage prevention, and averting attacks on infrastructure or equipment.

Q. Is there any tension between natural gas reliability and the state's decarbonization goals codified in CETA and the CCA?

A. With the enactment of CETA and the CCA, PSE is transition planning from natural gas and moving towards other sources of fuel. However, PSE cannot immediately stop providing natural gas to its customers. PSE must continue to maintain existing infrastructure and equipment, respond to increasing requirements for pipeline safety actions such as the previously mentioned PIPES Act and PHMSA Mega Rule, while also determining ways to use new fuels within the existing pipeline as well as building new pipeline infrastructure when necessary. Please see Exh. DJL-1T, Exh. DJL-3, and Exh. DJL-6, for additional information regarding some of the impacts of clean energy transition on Energy Operations.

IV. PSE'S ENERGY OPERATIONS IS FOCUSED ON PROVIDING ENERGY SERVICE EQUITABLY TO CUSTOMERS

Q. How is PSE incorporating equity into Energy Operations?

A. PSE recognizes the impact it has on the communities and customers it serves. The testimonies of David Landers, Roque Bamba, and Ryan Murphy discuss specific

areas in which PSE is incorporating equity into Energy Operations. In addition, Troy Hudson discusses PSE's commitment to equity at a company-wide level.

PSE is incorporating equity considerations throughout the varying stages of its planning and execution processes. As discussed by David Landers in Exh. DJL-1T, equity considerations are now integrated into PSE's Investment Decision Optimization Tool so that equity is embedded into how PSE plans for and decides which projects and programs to implement. Energy Operations implements and executes the projects programs planned by System Planning and funded for implementation through PSE's corporate business planning process. As discussed in more detail in Exh. RBB-1T, Energy Operation's logistics, scope, design, schedule, funding, and communications are all conducted through an equity lens.

PSE is also taking measures to better understand the communities it serves so it can provide more equitable service. For example, GIS mapping helps PSE visualize and overlap community equity information, as explained in the Prefiled Direct Testimony of Troy A. Hudson, Exh. TAH-1T. In addition, Delivery System performance parameters, the combination of which enables the Delivery System Scorecard discussed in David J. Landers, Exh. DJL-1T, can be used by System Planning staff for a comprehensive assessment of community needs and opportunities.

Moving forward, PSE has been focusing on building dashboards that use data to understand performance in areas like response times, service request times, underperforming parts of the system, reoccurring outages, trending equipment

failures, capacity issues, and technology adoption. As this data is developed, it will help PSE better understand its service practices and how it can provide more equitable service across its customer base. Energy Operations will continue to evaluate new tools and methods to incorporate equity into its services.

V. CONCLUSION

Q. Does that conclude your prefiled direct testimony?

A. Yes, it does.