EXH. DJL-5
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: DAVID J. LANDERS

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

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

FOURTH EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF

DAVID J. LANDERS

ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 15, 2024

PUGET SOUND ENERGY

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I. RELIABILITY AND AUTOMATION INVESTMENTS

A. Overview

Q. Please briefly describe Puget Sound Energy's ("PSE") reliability and automation investments presented in this case.

A. The technical and organizational complexity of planning, building, and operating a modern grid to serve all customers while advancing energy equity across PSE's service area requires a strategic approach of interdependent investments in reliability, resiliency, and operational flexibility that prioritizes value to the customer. As customers become more dependent on electricity and have growing expectations for service reliability, investments that reduce likelihood of outages and/or deploy smart technology for quicker restoration following service disruptions are a key component of planned investments for the energy Delivery System. There are eight overarching investment programs with seventeen specific business plans that make up the reliability and automation investments detailed in Table 1 below.

Table 1: Summary of reliability and automation program plans.

Program	Program Plan
Automation	Distribution Automation
	Reclosers
	Transmission Automation
	Substation Supervisory Control and Data Acquisition
Cable Remediation	Cable Remediation
Circuit Modernization	Targeted Reliability
	Underground Conversion
Electric System Upgrades	Fusesavers
	Resilience Enhancement Expanded
	Resilience Enhancement – Copper Conductor
	Service Transformer Upgrade
	Root Cause Analysis
	Bellevue Central Business District
Submarine Cable	Submarine Cable
Voltage Reduction	Voltage Reduction
Microgrid & Energy Storage Pilots	Microgrid & Energy Storage Pilots
ADMS Advanced Apps	ADMS Advanced Apps

Q. Please describe how investments are managed through the reliability and automation programs.

A. Reliability and automation investments are developed through a programmatic portfolio optimization approach, meaning projects that best advance objectives of a program are selected for implementation. Projects identified for implementation are then individually designed and constructed with full engineering design, permitting, and project management oversight.

Q. Please provide PSE's planned capital investments relating to these eight investment programs over the rate period presented in this case.

A. Table 2 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 2: Summary of total program capital investments.

Program ($ millions)	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Automation	63.5	70.5
Cable Remediation	21.9	55.4
Circuit Modernization	77.0	48.4
Electric System Upgrades	34.1	26.3
Submarine Cable	8.8	6.2
Voltage Reduction	6.3	6.3
Microgrid & Energy Storage	0.6	0.8
ADMS Advanced Apps	4.2	0

Additionally, there is incremental operations and maintenance ("O&M") related to capital investment ("OMRC") associated with the above investments that totals about $4.8 million over the two-year period.

Q. Do these programs or plans address the same assets such that there could be double counting of investments or benefits?

A. No. As discussed in Prefiled Direct Testimony, Exh. DJL-1T, plans address specific populations of assets or improve circuit performance. While the type of equipment may be the same, PSE has defined each program's project population carefully such that there is no financial double counting. For example, pole

replacements required as part of a copper overhead conductor replacement project are not also budgeted in the pole inspection and replacement plan.

Q. Are O&M or other capital cost reductions expected to result from these program investments?

A. Yes. O&M and other capital expenses are reduced by these programs. O&M expenses include operating activities such as emergency response for outages, property and easement maintenance, asset health monitoring and mitigation, quality control, repair of damaged infrastructure, metering, and routine patrols and inspections. PSE's reliability and automation capital investments are primarily focused on reducing occurrence and duration of outages so while an outage may still occur and require repair; time, costs, and impacts associated with the response may be lessened. Emergency repairs often include capital expenses when damaged or failed equipment must be replaced in kind, so this plan reduces these emergency capital expenses as well as O&M expenses.

The following are examples of capital investments that reduce specific O&M and capital expenses:

Fusesaver installation. For every 150 fusesavers installed, PSE anticipates avoiding 64 blown fuses per year for all-in events across all fusesaver locations. Avoidance of these unplanned emergency repairs provides annual O&M savings of approximately $40,000 for every 150 devices installed.

Circuit undergrounding. Converting portions of overhead circuits to underground, which is part of the Circuit Modernization program, helps eliminate outages caused by trees and car-pole accidents. This reduces unplanned emergency repairs and eliminates the need for cyclical vegetation management on that portion of a circuit. PSE's Circuit Modernization program includes this type of solution when appropriate, from which PSE estimates an O&M expense savings of approximately $250,000 to $500,000 annually. Capital expenses are avoided as well since poles and other assets are no longer struck by vehicles or falling trees in sections where circuits have been placed underground. These O&M expense reductions help to relieve the increasing O&M expense pressures discussed in Exh. DJL-1T.

Q. Please describe the benefits that PSE's reliability and automation program investments will deliver for customers through the rate plan.

A. Primary benefits of this program are preventing or reducing the number of future outages and outage durations experienced by customers. Table 3 summarizes benefits of reduced customer minute interruption ("CMI") over the rate period presented in this case.

Table 3: Summary of total program reductions in CMI by year.

Program	CMI Benefit in 2025	CMI Benefit in 2026
Automation	10.7	11.2
Cable Remediation	1.7	3.1
Circuit Modernization	2.9	2.7
System Upgrades	2.3	1.9
Submarine Cable[1]	0.0	0.0
Voltage Reduction[2]	0.0	0.0
Microgrid & Energy Storage Pilots[3]	0.0	0.0

ADMS Advanced Apps[4]	0.0	0.0
Program Total	17.6	18.9

1. Submarine cable projects will be in development during the rate plan period, but not placed in service until later years, thus no CMI benefits are expected in 2025-2026.
2. Voltage reduction provides improvements in delivery system operating efficiency, and the primary benefit to customers is energy and cost savings rather than CMI.
3. Microgrid & Energy Storage pilots are new applications of technology, therefore CMI benefits are not listed since operational attributes are yet to be tested and verified.
4. Initial benefit of ADMS advanced applications, enabling integration of new technology, does not provide directly attributable CMI benefits.

Q. Please describe performance metrics these investments impact.

A. These investments impact the following corporate performance metrics by reducing outage occurrences and improving the speed with which repairs can be made and power restored when outages do occur:

- 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);
- SQI #2 – Complaints to the WUTC per 1,000 customers.

Q. Please describe each program and program plan.

A. Each program plan will be discussed below including planned investment and core objectives, basis for forecasted investment and benefits anticipated, and incremental OMRC associated with each plan.

Q. Please describe how cost estimates are developed that support these programs.

A. PSE's Project Delivery organization provides planners with cost estimating tools informed by average costs of historical projects and unit pricing in current contracts. Planners use these tools to estimate costs based on planning-level scopes of work. These tools are updated as needed to reflect changes in cost trends or contractual unit pricing.

Q. Please describe cost controls employed to efficiently deploy capital expenditures.

A. Cost controls deployed by PSE for programmatic and specific investments are discussed in the Prefiled Direct Testimony of Roque B. Bamba, Exh. RBB-1T.

B. Equity

Q. Please describe how PSE has considered equity in these reliability and automation investments.

A. As discussed in my Prefiled Direct Testimony, Exh. DJL-1T, PSE's Delivery System Planning team seeks to advance energy equity in project portfolio development by utilizing new geospatial information system (GIS) tools that provide visualization of local customer and community equity data to inform project needs identification. Identified projects are then evaluated using PSE's Investment Decision Optimization Tool ("iDOT"), through a process that has been enhanced to include equity-related benefits based on input from PSE's

Equity Advisory Group ("EAG"). Additionally, in 2023, Delivery System Planning piloted a customer engagement framework to better understand impacts and customer energy burdens from power outages occurring on a circuit serving an area of named community customers. This pilot helped inform approaches to equity consideration in planning of future distribution system projects.

Furthermore, prioritization of projects is informed through an equity lens. As an example, when implementing dissolved gas analysis ("DGA") monitoring at substation transformers for early detection of anomalies that can lead to failure, substations serving named communities were selected first to receive this technology, hence reducing the likelihood of a major unplanned outage occurring in these communities due to major substation equipment failure.

C. Automation Program

Q. Please describe the purpose of the Automation program.

A. The Automation program focuses on deployment of smart technology to improve reliability and resiliency. There are four key program plans PSE is investing in over this rate period: Distribution Automation, Reclosers, Transmission Automation, and Substation Supervisory Control and Data Acquisition ("SCADA").

These investments are increasingly important as customers become more dependent on reliable electricity for a greater share of their energy needs, driven largely by electric vehicle adoption and transition from the use of natural gas to

electricity for space and domestic water heating. Furthermore, investments to improve data transfer and communications, such as substation SCADA, enable management of distributed energy resources and bi-directional flow on the grid, which is essential to supporting load growth and reliability with customer-sited energy resources.

Q. Please describe each of the key program plans and its core objectives and priorities.

A. The four key program plans of the Circuit Modernization program are supported by the Corporate Spending Authorization ("CSA") – Grid Automation, provided in Appendix B along with supporting business plans which describe the program backgrounds in further detail:

Distribution Automation Business Plan. The Distribution Automation Business Plan drives deployment of smart technology to dramatically reduce the length of outages experienced by customers. Specifically, Distribution Automation – Fault Location, Isolation, Service Restoration ("DA FLISR"), also referred to as "Distribution Automation" or "DA," automates outage restoration on PSE's distribution system by using sensors to locate faults, remotely operating switches to isolate faulted sections, and restoring power to the non-faulted sections. The DA FLISR system collects information from devices and determines optimal switching to restore power to the largest number of customers possible in less than five minutes. The faulted section will remain without power until crews can repair the damage. Strategic deployment of DA FLISR schemes reduce customer

minutes of interruption, SAIDI, and SAIFI, by reducing the number of customers experiencing a sustained service interruption from any one outage event. Please see Appendix B for the detailed Distribution Automation Business Plan supporting this investment.

Reclosers Business Plan. This plan proposes addition of new reclosers for reliability and sectionalizing on a subset of PSE's feeder circuits and replacement of aging/obsolete reclosers and sectionalizers. These specialized protective devices sectionalize and reduce the number of customers impacted by a permanent fault on main line feeders. Priority is given to areas with the highest customer minutes of interruption. The installation of reclosers also eventually supports the Distribution Automation Business Plan as circuits where reclosers are added or replaced have DA FLISR installed as part of the DA FLISR program. Metrics for the DA FLISR plan are accounted for separately to prevent double counting of costs and benefits. Please see Appendix B for the specific Reclosers Business Plan supporting this investment.

Transmission Automation Business Plan. Transmission Automation is a method of automatic switching that uses sensors to detect transmission line faults. Once a fault is detected, a centralized controller performs automatic switching to isolate the faulted line section and restore the remaining sections. This method, called Transmission Line Automated Switching ("TLAS"), is an improvement over the existing automatic switching method that uses pre-programmed timed "trial-and-error" switching rather than sensors, to determine the location of a

transmission line fault. Please see Appendix B for the specific Transmission Automation Business Plan supporting this investment.

Substation SCADA Business Plan. The Substation SCADA Business Plan is a programmatic approach to bringing supervisory control capability to all PSE distribution circuits. Implementation is being prioritized by substation location based on customer counts and historical outages. Additionally, acceleration of Substation SCADA investment supports PSE's Clean Energy Implementation Plan ("CEIP") by providing communications and data capabilities to manage bi-directional power flow on the distribution grid for enabling and managing distributed energy resources. Traditionally, and in addition to advancing the CEIP, the primary objective of the plan is to improve reliability on distribution circuits, restore power to customers faster, and reduce outage durations. Please see Appendix B for the specific Substation SCADA Business Plan supporting this investment.

Q. Please provide PSE's planned Automation program capital investments and work anticipated over the rate period presented in this case.

A. Table 4 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 4. Summary of Automation Program capital investments by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Distribution Automation Capital	32.7	36.3

investment ($ Millions)		
Projects (#)	22	19
Recloser Capital investment ($ Millions)	3.6	4.0
Projects (#)	35	40
Transmission Automation Capital investment ($ Millions)	4.7	5.2
Projects (#)	28	34
Substation SCADA Capital investment ($ Millions)	22.5	25.0
Projects (#)	21	30

Additionally, there is incremental OMRC associated with the above rate period of about $1.1 million.

Q. Please describe the basis for planned Automation program investments.

A. Please see each program business plan for the basis of forecasted investment and cost estimating assumptions. General trends in Automation program spending are discussed below.

Distribution automation. At the end of 2022, approximately 122 out of the 1,124 distribution circuits in PSE's electric system had DA FLISR enabled. By the end of 2030, the plan is to have approximately two-thirds of all PSE circuits enabled with DA FLISR. Based on outage data from 2018 to 2022, there are approximately 520 circuits identified as having "high CMI." These circuits have greater than 150,000 average annual all-in CMI from outages originating on feeders, and 356 of these circuits serve named communities. Focusing deployment of DA FLISR on these high CMI circuits will drive advancement of energy equity and improvement of reliability metrics. Performance monitoring of the initial

population of deployed devices, re-analysis of circuit and system capabilities, and ongoing evaluation of circuit performance and customer and equity needs will guide decisions on locations for deployment of DA FLISR schemes within and beyond the plan. Cost estimates are based on historical average costs of the typical work needed to implement Distribution Automation schemes on a per circuit basis adjusted by traditional escalators.

Reclosers. The plan is currently proposed to run through at least 2028 to address locations where reclosers are feasible and beneficial. As of 2023, System Planning estimates that approximately 350 circuits are eligible for a new recloser. Replacing obsolete or oil filled reclosers and sectionalizers will account for another 45 reclosers for a total population of 395 reclosers. Program funding is planned to stay consistent with the previous rate plan. The plan will evenly distribute between new installations and replacements. Estimated costs are based off historical costs allowing for variations in project scope, increases in project cost due to inflation, and added contingency to account for unforeseen conditions.

Transmission automation. During the rate plan, the program will build off of lessons learned during pilot installations, upgrade existing schemes to the latest technology, and install fiber communications infrastructure to improve operation schemes. Additional funding to expand the fiber for TLAS is required for portions of the system, to decrease the communication latency of automation. PSE plans to target a steady pace of TLAS installations on PSE transmission lines with more

than one substation annually over the next 15 years. The cost estimate is based on the pilot cost analysis adjusted by traditional escalators and added costs for fiber.

Substation SCADA. PSE plans to increase funding levels for the Substation SCADA program over the rate plan. Funding is anticipated to hold steady after this ramp-up through at least 2029. This increase from prior years supports the CEIP and the need for SCADA capabilities to implement Distribution Automation projects. At the end of 2022, there are approximately 125 substations requiring SCADA for some or all breakers. This plan provides that all PSE owned feeder breakers have supervisory control. Cost estimates vary due to inflation and added contingency to account for unforeseen conditions associated with each substation.

Q. Have benefits been realized from the Automation program?

A. Yes. Benefits have been realized for the Automation program.

Distribution Automation. In 2022, there were 29 successful DA FLISR operations that saved approximately 3.9 million CMI and 3.20 SAIDI minutes. As of November 2023, successful DA FLISR operations have saved approximately 2.8 million CMI and 2.35 SAIDI minutes with a 68 percent operational success rate. As experience is gained with the deployment and operation of this technology, the successful operation percentage will rise as shown by an increasing operation success rate since 2018, which had a success rate of 52 percent.

Reclosers. Since the start of 2022, there have been 55 reclosers installed under this program. About one-third were new installations and two-thirds were oil-filled, Joslyn, or sectionalizer replacements. These projects are projected to save over 2.0 million CMI.

Transmission Automation. From January 2022 through November 2023, this program recorded 18 TLAS operations with a savings of 6.77 million CMI or 5.66 SAIDI. In addition, about 46,000 customers were saved from an outage (0.04 SAIFI) and 67 percent of the operations were deemed successful. Savings calculations are compared to no automated switching on the system. Additional safety and wildfire benefits are being explored and will be integrated into the program. Minutes saved are based on an "all in" approach inclusive of both Non-Storm and Storm events.

Substation SCADA. From 2022 through 2023, approximately 22 substations received added SCADA capabilities, resulting in operational enhancements saving approximately 5.5 million CMI. Adding SCADA capability to substations improves operational flexibility and decreases outage concerns. The primary benefit of the Substation SCADA plan is improved reliability for distribution circuits when aligned with Distribution Automation projects. The ability to remotely monitor and operate circuit breakers allows system operators to restore customers faster and reduce overall outage durations.

Q. Please describe the benefits PSE's Automation program will deliver for customers through the rate plan.

A. The primary benefit of this plan is improved reliability. Automation will reduce CMI by reducing the number of customers affected by sustained substation or circuit outages. Table 5 provides the projected benefits of CMI avoided over the rate period presented in this case.

Table 5. Summary of Automation Program by Rate Period

Type of Benefit	Rate Plan Year 1 2025	Rate Plan Year 2 2026
DA Customer Minute Interruption (# millions)	3.4	3.0
Recloser Customer Minute Interruption (# millions)	0.8	0.9
TA Customer Minute Interruption (# millions)	0.9	0.9
SCADA Customer Minute Interruption (# millions)	5.6	6.4
Program Total	10.7	11.2

D. Cable Remediation Program

Q. Please describe the Cable Remediation program and core objectives and priorities.

A. The Cable Remediation program focuses on remediating direct-buried electrical distribution cable with a trended probability of failure, predominantly consisting of vintage bare concentric neutral cable with high molecular weight ("HMW") insulation that is prone to failure. The objective is to improve service reliability to

customers and reduce unplanned outages by proactively replacing these cables in advance of escalating failures requiring repair. This is supported by the CSA – Cable Remediation, provided in Appendix C along with supporting business plans which describe the program backgrounds in further detail.

Q. Please provide PSE's planned Cable Remediation Program capital investments and work over the rate period presented in this case.

A. Table 6 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 6. Summary of Cable Remediation Program Capital Investments by Year

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Cable Remediation Capital investment ($ Millions)	21.9	55.4
Miles (#)	58	94

Additionally, there is incremental OMRC associated with the above rate period of about $0.3 million.

Q. Please describe the basis for the forecasted Cable Remediation Program investments.

A. Please see the Cable Remediation Business Plan for the basis for the forecasted investment. In summary, failure rates of HMW insulated cable continue to increase with age, requiring continuous strong investment in the program to overcome declining reliability. In 2016, PSE began to more aggressively address

this issue, replacing on average 122 miles of failure prone cable a year through 2019. In 2020, PSE completed only 42 miles due to impacts from COVID-19. Since 2021, PSE has replaced on average 52 miles a year of cable to reduce cable outages. PSE's plan is to ramp to a target of approximately 70 miles per year within this rate plan. This forecast is based on capacity of third-party resources, permitting processes, and street restoration requirements as well as managing scheduled outage impacts. The programmatic costs to complete the remaining population of failure-prone HMW cable per the Cable Remediation Business Plan is approximately $926 million to be invested over the next twenty years. The cost is estimated based on historical unit cost of dollars per trench foot which is converted into miles and current contractual unit pricing adjusted by traditional escalators. Cost estimates vary due to project challenges, inflation, and the rate of replacement each year.

Q. Have benefits been realized from the Cable Remediation Program?

A. Yes. Confidence in plan benefits is based on historical benefits realized through the program. As documented in the business plan, since 2016 when customers experienced over 1,000 cable outages, cable outages have decreased by approximately 35 percent through 2022 as a direct result of the program ramp-up.

Q. Please describe the benefits PSE's Cable Remediation Program will deliver for customers through the rate plan.

A. The primary benefit of the plan to PSE's customers is improved reliability. Table 7 provides the projected benefits of customer minute interruption avoided over the rate plan.

Table 7. Summary of Cable Remediation Program Benefits by Year

Type of Benefit	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Cable Remediation Customer Minute Interruption (# millions)	1.7	3.1

E. Circuit Modernization Program

Q. Please describe the key program plans included in the Circuit Modernization program and core objectives and priorities.

A. The Circuit Modernization program focuses on implementing solutions to harden the grid and minimize outages. There are two key program plans that PSE is investing in over the rate plan: Targeted Reliability and Underground Conversion.

Q. Please describe each of the program plans in more detail.

A. The two key program plans of the Circuit Modernization program are supported by the CSA – Grid Circuit Modernization, provided in Appendix D along with supporting business plans which describe the program backgrounds in further detail. Key highlights of the programs are provided below:

Targeted Reliability Business Plan. The Targeted Reliability Business Plan supports improved customer experience by improving performance of feeders and laterals experiencing a lower level of reliability. Historically, the Worst Performing Circuits ("WPC") plan focused on improving the 135 WPC defined in 2017 and the remaining 965 circuits outside the WPC plan were addressed by the Targeted Reliability Business Plan. The WPC plan is substantially complete and will sunset in 2024. Going forward all circuits will be reviewed, and projects implemented under the Targeted Reliability Plan to maximize impact of the investment, including prioritization for advancement of energy equity in named communities. This plan includes overhead or underground rebuilds, Tree Wire upgrades, underground conversion, feeder ties, implementation of improvements identified through PSE's root cause analysis ("RCA") program, and supports other reliability improvements such as utilization of batteries where cost effective for addressing reliability concerns on radial and remote circuits. It is important to note this plan does not include DA FLISR, reclosers, fusesavers, or copper replacement as each of those types of projects have a standalone business plan. This is a programmatic plan to improve customer reliability experience across all of PSE's distribution circuits and in named communities for advancement of energy equity. This plan is different than many other asset-focused plans because Targeted Reliability plans are a comprehensive focus on total circuit performance. As a result, recurring periodic reviews of circuit performance are required and needed improvements may evolve over time with changing conditions. Additionally, improvements of this plan provide operational flexibility to better

support customers during planned work and outages. Please see Appendix D for the specific Targeted Reliability Business Plan in support of this investment.

Underground Conversion Business Plan. This plan programmatically targets a subset of PSE's overhead electric distribution feeder system for underground conversion. The purpose of this plan is to improve system reliability by reducing exposure to hazards and to substantially improve resiliency of the distribution system during major events. While outages on backbone system feeder lines are less frequent than on radial lines they are a significant contributor to overall company SAIDI performance, therefore decreasing feeder outages will have a measurable impact on overall system performance. This plan is different from the Targeted Reliability Business Plan because it proactively targets highest risk feeders exclusively for underground conversion. While past performance is taken into account, expected future performance and a risk assessment based on circuit exposure to hazards and customer counts informs investments for the greatest reliability improvement. Please see Appendix D for the specific Underground Conversion Business Plan in support of this investment.

Q. Please provide PSE's planned Circuit Modernization program capital investments and work anticipated over the rate period presented in this case.

A. Table 8 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 8: Summary of Circuit Modernization program capital investments by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Targeted Reliability Capital investment ($ Millions)	58.4	36.7
Projects (#)	27	16
Underground Conversion Capital investment ($ Millions)	18.6	11.7
Projects (#)	4	4

Additionally, there is incremental OMRC associated with the above rate period of about $1.9 million.

Q. Please describe the basis for the forecasted Circuit Modernization program investments.

A. Each of the business plans for investments categorized under the Circuit Modernization program provides a basis of detailed needs, planned programmatic investments and estimated cost of implementation.

Targeted Reliability Business Plan. This program is an on-going and it is expected this plan will continue at a steady rate to address emerging system needs. The circuits with high reliability needs, as determined by reliability metrics SAIDI, SAIFI, CMI, and CEMI over the previous five years, will be addressed through this program. Additionally, the 135 WPCs as determined in 2017 will continue to be reviewed as part of this program and needs will be addressed. As the WPC plan approaches completion in 2024, the Targeted Reliability Upgrade plan will provide consistent ongoing benefits prioritizing considerations system-wide for advancements in energy equity. Estimated costs are based on historical

costs of similar types of projects, with allowances for variations in project scope, increases in project cost due to inflation, and added contingency to account for unforeseen conditions associated with projects. Specific project costs can vary due to circuits requiring a variety of improvements or combination of improvements. Specific project solutions may require tree wire reconductor, pole replacements, reclosers, or partial underground conversion.

Underground Conversion Business Plan. This program has a decrease in reliability specific funding level during the rate plan as much underground conversion work is being prioritized for mitigation of risks in high wildfire threat areas and will be implemented under the Wildfire Risk Mitigation program discussed in the Prefiled Direct Testimony of Ryan Murphy, Exh. RM-1T. Funding remaining in the Underground Conversion program will allow PSE to improve reliability and resiliency by reducing hazard exposure on PSE's overhead distribution feeders in areas where sustained feeder outages are commonly associated with overhead conductor. This type of system failure is identified as the cause for roughly four percent of all outages by count but contributes approximately 36 percent of All-In CMI. Estimated costs are based on historical costs of similar types of projects, with allowances for variations in project scope, increases in project cost due to inflation, and added contingency to account for unforeseen conditions associated with projects.

Q. Have benefits been realized from the Circuit Modernization program?

A. Yes. Benefits have been realized for the Circuit Modernization Program.

Targeted Reliability Business Plan. Since the start of 2022, the program has completed approximately 43 projects. Completed project types include tree wire installation, feeder tie installations, and underground conversions on circuit laterals. These projects saved an approximate total of 4.7 million CMI.

Underground Conversion Business Plan. The underground conversion program was initiated in 2021 to address high customer count / high exposure feeders to improve system reliability and resiliency during major storm events. Projects for the underground conversion program were first funded in 2023 with projects still in various phases of permitting and design.

Q. Please describe the benefits that PSE's Circuit Modernization program investments will deliver for customers through the rate plan.

A. The primary benefits of this program are preventing or reducing the number of future outages and outage duration experienced by customers. Table 9 provides the benefits of customer minute interruption avoided over the rate plan presented in this case.

Table 9: Summary of Circuit Modernization program benefits by year.

Type of Benefit	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Targeted Reliability Customer Minute Interruption (# millions)	2.4	2.2
Underground Conversion Customer Minute Interruption (# millions)	0.5	0.5
Program Total	2.9	2.7

F. Electric System Upgrades Program

Q. Please describe the key program plans included in the Electric System Upgrades program and core objectives and priorities.

A. The Electric System Upgrades program focuses on replacing PSE's aging electric system assets, investigating root cause analysis of high impact outages to inform effective reliability program development, and addressing reliability issues within the Bellevue Central Business District through switch maintenance and automation. There are six key areas that PSE is investing in over the rate plan: Fusesavers, Resilience Enhancement – Expanded, Resilience Enhancement – Copper Conductor Replacement, Service Transformer Upgrade, Root Cause Analysis, and Bellevue Central Business District.

Q. Please describe each of the program plans in more detail.

A. The six key program plans of the Electric System Upgrades program are supported by the Corporate Spending Authorization CSA – Grid Modernization Electric System Upgrades, provided in Appendix E along with supporting business plans which describe the program backgrounds in further detail. Root Cause Analysis ("RCA") is an operational program led by PSE's Engineering organization with participation by numerous departments across Operations to investigate and identify projects and/or programs to improve system reliability. Similarly, Bellevue Central Business District work is managed by regional system engineers in Customer & System Projects to scope and manage specific projects for enhanced reliability and customer service. As such, the RCA and Bellevue

Central Business District components of Electric System Upgrade work do not include business plan documentation accompanying the CSA under which they are funded; however, the programs are described in detail as part of this exhibit.

Fusesavers Business Plan. The Fusesavers Business Plan replaces existing single-operation fuses (100T) on the electric distribution system with specialized protection devices. These devices reduce the frequency of sustained power interruptions by quickly tripping to clear temporary faults and restoring power following a momentary outage. Please see Appendix E, for the specific Fusesavers Business Plan in support of this investment.

The Resilience Enhancement Copper Conductor Replacement Business Plan. The plan focuses on replacing aging smaller overhead copper (CU) conductors in PSE's primary distribution system. Copper conductor loses mechanical strength as it ages and has an increasing risk of failure. Investments will prioritize sections located in areas of high wildfire risk in addition to historically focusing on sections with the greatest degradation based on history of outages and/or splices on the conductor. Please see Appendix E, for the specific Resilience Enhancement – Copper Conductor Replacement Business Plan in support of this investment.

The Resilience Enhancement Expanded Plan. This plan includes multiple initiatives to improve and enhance resiliency on vulnerable sections of aging Transmission and Distribution infrastructure, including Condition Monitoring of Substation Transformers, Underground Substation Getaways – yellow jacket cables experiencing insulation shrink-back, Transmission Switches, and

Distribution Radial Circuits. The plan targets the replacement of aging line assets that weaken resilience of distribution circuits and transmission lines, such as switches and underground assets, which are not addressed under other plans. In addition to replacement of aging assets, PSE aims to improve resiliency of radial distribution circuits, typically located in remote areas without backup power sources, through the use of energy storage batteries. This plan also looks to implement proactive monitoring of major substation assets, providing better insight through real-time condition assessment to monitor transformer health and predict equipment failures. Please see Appendix E, for the specific Resilience Enhancement Expanded Plan in support of this investment.

Service Transformer Upgrade Business Plan. The Service Transformer Upgrade Plan is an ongoing proactive plan to upgrade overloaded service transformers to maintain the continued reliability of PSE's electric distribution system. This plan is driven by growing electrification, including widespread electric vehicle adoption and increased frequency of severe warm weather events. Please see Appendix E, for the specific Service Transformer Upgrade Business Plan in support of this investment.

Root Cause Analysis. The Root Cause Analysis program investigates causes of high-impact outages through in-depth investigation so PSE understands the cause(s) and future risks to reliability. The core objective of the program is to improve reliability by identifying root causes, addressing immediate issues, and building greater awareness and knowledge to prevent future issues. The program

investigates the method of design, maintenance of systems, and restoration procedures to identify and implement solutions for improved reliability. This program also develops and implements specific solutions based upon root cause analysis investigations with recent actions including a Line Spacers program and livefront to deadfront switch transition program. The Line Spacers program was created and implemented by the Customer & System Projects team to reduce the number of outages related to electrical fault line slap caused by insufficient phase to phase clearance in various distribution line constructions. The livefront to deadfront switch transition program was created to help mitigate system reliability risk from older switches that sit on vaults that cannot easily be replaced on a one-for-one basis on failure due to cost prohibitive civil or line work being required. An additional benefit of transitioning to deadfront switches is the increased reliability they provide compared to livefront switches. Deadfront switches are less prone to faults caused by rodents and contamination.

Bellevue Central Business District. The Bellevue Central Business District program is focused on addressing reliability challenges encountered in Bellevue's Central Business District area. This program expands existing SCADA infrastructure to provide remote visibility and control in PSE's densest load area. Historic projects have been focused on improving reliability through switch maintenance including switch replacement, refilling gas, and automating existing switches by extending the communication network for connection to PSE's SCADA infrastructure.

Q. Please provide PSE's planned Electric System Upgrades program capital investments and work anticipated over the rate period presented in this case.

A. Table 10 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 10: Summary of Electric System Upgrades program capital investments by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Fusesaver Capital investment ($ Millions)	4.1	3.2
Projects (#)	110	80
Resilience Enhancement Expanded & Copper Replacement Capital investment ($ Millions)	12.3	9.5
Projects (#)	47	38
Service Transformer Upgrade investment ($ Millions)	10.5	8.1
Projects (#)	700	540
Root Cause Analysis Capital investment ($ Millions)	3.2	2.4
Investigated causes (#)	36	36
Bellevue Central Business District Capital investment ($ Millions)	3.6	2.8

Additionally, there is incremental OMRC associated with the above rate period of about $1.3 million.

Q. Please describe the basis for the forecasted Electric System Upgrades program investments.

A. Each of the business plans for investments categorized under the Electric System Upgrades program provides a basis of detailed needs, planned programmatic investments and estimated costs of implementation.

Fusesavers. Pilots for this program started in 2017 and PSE began installing fusesavers programmatically in 2020. PSE's plan ramps up from prior years with a forecast of installing 190 fusesavers over the rate plan. Cost estimates are based on historical average costs adjusted by traditional escalators.

Resilience Enhancement. Since 2010, PSE has replaced or retired copper conductor at an average rate of about 16 miles annually. PSE's planned investments for this rate plan appear to be on a lower pace, targeting about 5.3 miles annually, but copper conductor will also be replaced through other business plans, including Targeted Reliability, Pole Inspection and Remediation, and Targeted Capacity Upgrades. The combination of these business plans will result in the additional replacement of five to ten miles of copper conductor per year, keeping the planned replacement of this aging asset on track. The business plan focuses on the next ten years, replacing about 116 miles, estimated at approximately $35 million. To address the entire population of copper conductor, 587 miles, the programmatic cost is approximately $176 million. The costs are estimated based on historical average costs of copper replacement projects adjusted for current contractual unit pricing and traditional escalators.

The resilience enhancement expanded program began in 2022 with just one resilience initiative to install dissolved gas analysis ("DGA") monitors on existing critical transformers. Initial budget spend was approximately $1.5 million with an increase in 2023 to address additional DGA monitors plus the growing concern of defective substation getaways. The budget for the rate plan has increased as PSE plans for the replacement of older malfunctioning transmission switches as well as selecting a radial circuit experiencing poor reliability to add an energy storage battery. This increased budget is required to facilitate a large list of compromised substation getaways, aging transmission switches, and additional DGA monitors to provide condition monitoring of transformers. The costs are estimated based on historical average costs of similar projects adjusted for traditional escalators.

Service Transformer Upgrade. The Service Transformer Upgrade program is a newly developed program with no historical funding prior to 2022. In June 2021, PSE's service territory experienced a three-day period of high ambient temperatures known as a heat dome. 289 distribution transformers failed during this heat dome due to increased loading coupled with sustained high temperatures not allowing transformers to cool. A root cause analysis found the rate of service transformer failures increased at 88°F ambient conditions, with another steep increase at 95°F. This program seeks to mitigate the impact of future severe weather events by reducing the population of overloaded transformers that are likely to fail during periods of high ambient temperatures. Planned investment for this program increases to address approximately 500 to 700 service transformer upgrades annually during the rate plan. The program was funded at a lower

amount in its initial years as material, engineering and crew availability for the program ramps up. Estimated costs for the program are based on the population estimates and sizes of overloaded service transformers.

Root Cause Analysis. This program will support 30 to 40 root cause analysis investigations annually during the rate plan. Costs for the program are based on estimates to implement specific projects identified through root cause analysis investigations.

Bellevue Central Business District. The program includes maintenance on pad mount and underground switches including replacement of existing switches, SF6 gas replacement, and extending communications for SCADA enablement of existing switches. Projects are managed through PSE's Customer & System Projects team due to the close customer coordination required due to large and critical loads served in the Central Business District. For example, key projects completed since 2022 include SF6 gas replacement on switching for a large hotel, a switch valve replacement for a critical hospital load, and fiber loop installations for customer projects. In-progress projects at time of this filing include a large retail center reliability project and a fiber extension for Clyde Hill Substation. Future planned projects include extending the fiber network to a shopping center and replacement of non-SCADA switches. As demonstrated by these examples, project types vary based on customer and system needs, with project cost estimates and program forecasts based on historical costs and planned project work.

Q. Have benefits been realized from the Electric system Upgrades program?

A. Yes. Benefits have been realized as detailed below:

Fusesavers. During 2022 through 2023, over 100 fusesavers were installed providing a savings of over 530,000 CMI.

Resilience Enhancement. During 2022 and 2023, the program achieved approximately 62,000 CMI savings through replacement of substation getaways and installation of DGA monitors. Also, in 2023, two copper replacement projects were completed representing a CMI savings of approximately 16,000.

Service Transformer Upgrade. The primary benefit of this program is reducing the population of overloaded service transformers that are likely to fail during periods of high ambient temperatures. Proactive replacement of these transformers reduces the likelihood of unplanned outages and CMI. PSE estimates that service transformer upgrades on average reduce CMI by 1,770 per project.

Root Cause Analysis. The primary benefit of this program is improving PSE's reliability indices through robust outage investigation, strategic culture change, and application of comprehensive solutions to address immediate and foundational reliability risks. To address foundational risks and culture change, the RCA Program has identified and remedied several risks to reliability due to outdated language in design standards and operating procedures. An immediate risk addressed by the RCA Program has been the Line Slap Program, which has addressed the risk of 1.9 million CMI per year by completing projects on 12

circuits to prevent future outages of the same nature. In addition, another immediate risk identified and being addressed by the RCA Program is livefront to deadfront switch replacement, which is projected to save over 15,000 CMI per switch replaced.

Bellevue Central Business District. Benefits for this program include enhancing reliability for the Bellevue Central Business District and critical customers by extending the life of switches, providing inspections for underground facilities, and extending automated flexibility to control switches via SCADA. The program allows for better situational awareness when operating the system to avoid system overloading, faster troubleshooting and restoration during outage events, and better utilization of existing capacity.

Q. Please describe the benefits PSE's Electric system Upgrades program will deliver for customers through the rate plan.

A. PSE's primary benefit of this program is improved reliability and avoided CMI through replacement of aging assets and root cause analysis of high impact outages. Table 11 provides the projected benefits of CMI avoided over the rate period.

Table 11: Summary of Electric System Upgrades program benefits by rate period.

Type of Benefit	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Fusesavers Customer Minute Interruption (# millions)	0.2	0.2
Resilience Customer Minute Interruption (# millions)	0.8	0.6

Copper Replacement Minute Interruption (# millions)	0.1	0.1
Transformer Replacement Customer Minute Interruption (# millions)	1.2	1.0
Root Cause Analysis Customer Minute Interruption (# millions)	1.5	1.8
Program Total	2.3	1.9

1. Submarine cable projects will be in development during the rate plan period, but not placed in service until later years, thus no CMI benefits are expected in 2025-2026.

G. Submarine Cable Mitigation Program

Q. Please describe PSE's Submarine Cable Mitigation program and core objectives and priorities.

A. The Submarine Cable Mitigation Program focuses on proactively and programmatically addressing PSE's four transmission and 15 distribution submarine cables based on condition assessments or cable performance and repair history that indicates degraded integrity. This proactive programmatic approach results in lower costs associated with emergency temporary repairs or replacement that requires specialty out-of-state crews. The primary objectives of the plan are to maintain reliable and continued service to our customers, and avoidance of lengthy unplanned outages if the submarine cables were to fail before a replacement is in place. This is supported by the CSA – Submarine Cable Mitigation, provided in Appendix F along with supporting business plans which describe the program backgrounds in further detail.

Q. Please provide PSE's planned Submarine Cable Mitigation program capital investments and work anticipated over the rate period presented in this case.

A. Table 12 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 12: Summary of Submarine Cable Mitigation program capital investment by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Submarine Cable Mitigation Capital investment ($ Millions)	8.8	6.2
Miles (#)	0	0

Over the rate plan, no incremental OMRC is required.

Q. Please describe the basis for the forecasted Submarine Cable Mitigation program investments in more detail.

A. The program has been actively pursuing needs and solutions evaluation for Vashon Island submarine cables beginning in 2021 and for Mercer Island submarine cables starting in 2022. As these projects enter the project initiation stage, the process of field investigation, design/engineering and replacement of approximately 18 transmission submarine cable miles will be performed. The program budget will be increasing to approximately $8.8 million in 2025 and $6.2 million in 2026 to support engineering and assessment of submarine cable design and construction methods.

This plan is based on labor and plan development costs associated with engineering, permitting, and cable station upgrades adjusted for traditional escalators. Replacement of the four transmission submarine cables is approximately $122 million, but further alternative analysis will consider the condition, risks, and feasibility of other mitigation actions. Mitigation for the distribution submarine cables will be determined through alternative review. PSE anticipates hiring consultants for more accurate replacement costs which may result in adjusting the plan over time.

Q. Have benefits been realized from the Submarine Cable Mitigation program?

A. No. Submarine cables will be evaluated for construction method and cable design with anticipated replacement to begin in the future. As a result, no benefits have been realized yet.

Q. Please describe the benefits PSE's Submarine Cable Mitigation program will deliver for customers through the rate plan.

A. The primary benefit of the plan is avoided reliability concerns. However, the reliability projects to be implemented from this program are not expected to be completed during the rate period, therefore customer reliability benefits will not be claimed until future years when projects are placed in service. Table 13 reflects that benefits will not be realized until after this rate plan period.

Table 13: Summary of Submarine Cable Mitigation program benefits by year.

Type of Benefit	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Submarine Cable Mitigation Customer Minute Interruption (# millions)	0	0

1. Submarine cable projects will be in development during the rate plan period, but not placed in service until later years, thus no CMI benefits are expected in 2025-2026.

H. Voltage Reduction (for Distribution Efficiency) Program

Q. Please describe PSE's Voltage Reduction program and core objectives and priorities.

A. The Voltage Reduction (also called Distribution Efficiency) program focuses on voltage reduction as a proven technology for reducing energy and peak demand. PSE currently implements Conservation Voltage Reduction ("CVR") using Line Drop Compensation, where substation circuits are studied and modeled to determine substation voltage settings that keep the service voltage to the customer in the lower half of the acceptable voltage range during all normal load variations. This method requires manual intervention if unusual load or circuit configurations occur. With an Advanced Distribution Management System ("ADMS") and appropriate applications, voltage reduction can mature to a more integrated approach using Volt-Var Optimization ("VVO") that manages voltages and reactive power flows in the distribution network. This program supports both current implementation of CVR and development of VVO for implementation coinciding with the completion of PSE's ADMS Advanced Applications implementation.

The objective of this program is to optimize the voltage profile for all customers on a feeder, improve power factor, reduce line losses, and create energy savings for customers. This is supported by the CSA – Voltage Reduction Program, provided in Appendix G along with a supporting business plan that describes the program background in further detail. CVR is discussed in more detail in Bamba, Exh. RBB-1T, and in PSE's AMI benefits progress report, Exh. RBB-3, as it is a key benefit of AMI that PSE is already realizing. The discussion that follows supports the information in Exh. RBB-1T and Exh. RBB-3.

Q. Please provide PSE's planned Voltage Reduction program capital investments over the rate period presented in this case.

A. Table 14 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 14: Summary of Voltage Reduction program capital investments by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
Voltage Reduction Capital investment ($ Millions)	6.2	6.3
Substations (#) (CVR & VVO)	12	12

Additionally, there is incremental OMRC associated with the above rate period of about $0.2 million.

Q. Please describe the basis for the forecasted Voltage Reduction program investments in more detail.

A. The Voltage Reduction program supports compliance with Washington State's Energy Independence Act (Chapter 19.285 RCW). Specifically, energy savings from voltage reduction are included in PSE's Conservation Potential Assessment[1] and are part of PSE's Energy Efficiency targets filed as part of PSE's Biennial Conservation Plan and CEIP. The program has a target of implementing 12 voltage reduction projects (CVR or VVO) per year until all feasible substations are implemented. CVR and VVO are not funded through PSE's Electric Conservation Tariff Rider.[2] Estimated costs are based on historical costs of CVR implementation, increased costs to implement VVO projects, and additional needed equipment costs to replace older load tap changer controllers. Histories of operational issues with enabling voltage reduction have resulted in better-informed plans and cost estimates. Additional costs are also now included for line regulators needed so supplied voltage remains within acceptable levels.

[1] PSE's Integrated Resource Plan includes a conservation potential assessment that identifies conservation and demand side resources. Distribution efficiency and savings from voltage reduction programs are included in that assessment.

[2] Docket UE-210822 Condition 12c - Recovery of costs associated with distribution and production efficiency initiatives are not funded through the Electric Conservation Tariff Rider because these programs are not *customer* conservation initiatives. These are company conservation programs. As such, these costs are recovered in the general rate making process over time and may be requested through a general rate case, a deferred accounting petition or other allowed mechanism. The method of cost recovery in no way diminishes its obligation as required in Chapter 19.285 RCW and Chapter 480-109 WAC.

Q. Have benefits been realized from the Voltage Reduction program?

A. Yes. Realized benefits for the Voltage Reduction program are discussed in Roque Bamba's testimony, Bamba, Exh. RBB-1T and Exh. RBB-3.

Q. Please describe the benefits PSE's Voltage Reduction program will deliver for customers through the rate plan.

A. PSE's primary benefit of this plan are avoided energy costs. Table 15 provides benefits through the rate period presented in this case.

Table 15: Summary of Voltage Reduction program benefits.

Type of Benefit	
Avoided Cost of Energy over 20 years ($ millions)	26.8

I. Microgrid & Energy Storage Pilots

Q. Please describe PSE's Microgrid & Energy Storage pilot projects.

A. PSE is focused on Microgrid & Energy Storage pilot projects in partnership with the Washington Department of Commerce ("DOC") to develop and learn about microgrid technology and grid capabilities and support advancement of the technology across Washington state. In addition to supporting clean energy goals, these pilots allow PSE to develop the internal knowledge and skillset to translate technical possibilities into business processes and decisions for increasing utilization of microgrid and energy storage technology. In February 2020, PSE was awarded the third iteration of the DOC's Grid Modernization Clean Energy

Fund (CEF3) grant to install a utility scale 150 kW solar plus 1MW/2MWh storage Battery Energy Storage System ("BESS") to provide backup power to the Tenino High School in Tenino, Washington. The main use case is to provide backup power during a major weather event to enable use of the school as an emergency shelter, in addition to using the battery for grid services, such as frequency response and voltage support. The CEF3 project also includes the installation of a standalone neighborhood 1MW/2MWh BESS to provide resiliency support to the neighboring town of Bucoda, Washington, during an outage. The anticipated date for construction of these microgrids is currently targeted for Q4 2024, with the majority of the commissioning and use case testing occurring in 2025. This is supported by the CSAs – CEF3 & CEF4 Living Labs, provided in Appendix H.

In August 2021, PSE was conditionally awarded a CEF4 grant to perform an evaluation and feasibility study on two possible forms of backup generation at the Tenino High School, in tandem to the CEF3 project: a 100 percent hydrogen fuel cell and renewable natural gas blended with hydrogen (15 percent minimum target) generator. The CEF4 feasibility study will be performed in 2024, which will help inform the preferred solution for a backup generator at the Tenino High School.

Q. Please provide PSE's planned Microgrid & Energy Storage pilots capital investments over the rate period presented in this case.

A. Table 16 provides the planned capital investments from January 1, 2025 through December 31, 2026 based on programmatic plans.

Table 16: Summary of Microgrid & Energy Storage Pilots capital investments by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
CEF3 Capital investment ($ Millions)	0.3	0
CEF4 Capital investment ($ Millions)	0.3	0.8

Over the rate plan, no incremental OMRC is anticipated.

Q. Please describe the basis for the forecasted Microgrid & Energy Storage pilots capital investments in more detail.

A. The forecasted investment is based on costs for the two pilot projects that have been refined on an ongoing basis through a combination of historical labor costs, expertise from consultants, and RFI/RFP processes for material, construction, and commissioning.

Q. Have benefits been realized from the Microgrid & Energy Storage pilots?

A. PSE is anticipating to construct the CEF3 project in 2024 and the CEF4 project in the 2025-2026 rate plan. Reliability and grid benefits will begin after use case testing and final commissioning. PSE is already learning from this pilot project

including refining its approach to BESS technology, RFP evaluation processes, and establishing internal roles and responsibilities across organizations at PSE. It is critical to not only understand how these BESS work, but also how they will be integrated into the business, from Delivery System Planning, Engineering, IT and Operations. These pilots provide that this BESS project, and future ones, will continue to give value to customers and PSE throughout their full life cycle.

J. ADMS Advanced Apps

Q. Please describe PSE's ADMS Advanced Apps project and core objectives and priorities.

A. ADMS is an integrated software platform that provides the tools to monitor and control the distribution network in real time. Due to the large scope and complexities of implementing an ADMS, the project team split the project into three separate phases: (1) ADMS D-SCADA, or Phase 1 of this project, focused on transitioning the visibility and control capability from Energy Management System (EMS) to ADMS; (2) ADMS OMS, or Phase 2 of this project, transitioned Outage Management System capability from a tool that was no longer supported into the ADMS tool; and (3) ADMS Advanced Apps, or Phase 3 of the project, which will pursue advanced applications that enable distribution automation capabilities such as Fault Location, Isolation, Service Restoration (FLISR) and VVO. Implementing these advanced applications within the ADMS tool provides efficiencies to different operations groups, as well as provides

improved benefits from the current FLISR and CVR programs. This is supported by the CSA – ADMS Advanced Apps provided in Appendix I.

Q. Please provide PSE's planned ADMS Advance Apps capital investments over the rate period presented in this case.

A. Table 17 provides the planned capital investments from January 1, 2025 through December 31, 2026, which are estimated based on historic trends and programmatic plans.

Table 17: Summary of ADMS Advance Apps investments by year.

Plan	Rate Plan Year 1 2025	Rate Plan Year 2 2026
ADMS Advance Apps Capital investment ($ Millions)	4.2	0

Over the rate plan, no incremental OMRC is required.

Q. Please describe the basis for the forecasted ADMS Advance Apps capital investments in more detail.

A. PSE's forecast is based on the design phase estimate, informed by signed contracts and completed work thus far.

Q. Have benefits been realized from the ADMS Advance Apps?

A. ADMS Advance Apps will allow for the implementation of VVO and FLISR on a few selected pilot circuits/substations to help PSE understand how to best scale up

these programs in the new ADMS tool. The pilot is targeted to be complete in 2025, with benefits to follow in future years.

Q. Please describe the benefits PSE's ADMS Advance Apps will deliver for customers.

A. There are two primary benefits associated with our VVO and FLISR programs. ADMS Advanced apps enables PSE to shift PSE's Voltage Reduction program from CVR to VVO, which increases the energy and capacity cost savings to customers and PSE by lowering voltage and improving grid power quality beyond the value of CVR. In addition, ADMS Advanced Apps enables the optimization of PSE's DA FLISR program that allows for added reliability benefit compared to existing DA FLISR software capabilities.

II. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.