

**EXH. BEF-6
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: BRIAN E. FELLON**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

**Docket UE-240004
Docket UG-240005**

**FIFTH EXHIBIT (NONCONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF**

BRIAN E. FELLON

ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 15, 2024



EMS Platform Replacement
Corporate Spending Authorization (CSA)

| | |
|--|--|
| Date Created: | Friday, February 10, 2023 |
| Discretionary/ Non-Discretionary: | Non-Discretionary |
| Multi Year Rate Plan: | Specific |
| Equity Impact: | Yes |
| Strategic Alignment: | Evolve the Business-Operational Excellence |
| Estimated In-Service Date: | Saturday, October 31, 2026 |

Current State (Business Need):

Operation and control of the Transmission System has become more complex over the last decade due to fast evolving technology of transmission and generation assets, stringent NERC (North America Electric Reliability) regulations, and an increase in real-time operational workload. Within PSE’s Transmission Control Center (Load Office), the need for control room operators to have more effective and reliable tools to operate the grid and maintain high Situational Awareness (SA) has emerged as the most pressing area for systems improvement over the last several years. The Energy Management System (EMS) is the most critical and the primary software application used in the transmission control center. The EMS is an integrated platform and provides the following functions: • Monitor and control PSE’s power system in real-time, including the transmission system (high voltage) and the generating units. • Balance PSE’s generation and power interchange to meet its customers load and maintain system frequency. • Provide overall SA of PSE’s operating region and its neighboring Balancing Authorities. • Perform real-time contingency analysis to execute various “what-if” scenarios over the grid network to prepare for unplanned system interruptions. This project empowers our users with technology and business capabilities that will enable them to effectively perform their work on a system that we have confidence in to support our future business needs/requirements to successfully meet CETA and PSE 2030 objectives. Details supporting the business drivers for the EMS Replacement follow: Obsolete SCADA Hardware and Software: PSE’s current EMS system was upgraded in 2019, with no functional upgrade to its previous version. Our NERC regulated systems which support and control PSE’s Electric Transmission, Power Generation Facilities are entering into an obsolete state. Running end-of-life systems introduces the risk of irrevocable damage and costly downtime in the event of failure. When evaluating the lifecycle of a complete SCADA system, we need to consider all its components and their distinct life cycle and the cost of maintenance beyond their warranty period. Timeline for end-of-life SCADA components: 1. Windows 2012 Servers: Current EMS system is running on Windows 2012 servers, which is entering its extended warranty on Oct/2023 and the official date Microsoft would end support for 2012 servers is Oct/2026. EMS system is platform dependent, any upgrade to the platform warrants complete SCADA application upgrade. 2. GE’s M&S Support: Installed version of GE software entering custom M & S Support on May/2023 and their custom support ends as of Oct/2026. 3. Other Costs: Operating EMS as a legacy system has other risks and costs. If an EMS failure were to occur, obtaining support could be challenging, and extended downtime could result in expensive fines as well as other costs. Architecture Simplification: We require our future EMS vendor to have an architecture that meets current technology standards and has a product and technology roadmap that will meet and anticipate PSE’s future requirements.. This EMS must be easier to manage and maintain, as well as have all the advanced functions and features required by PSE. Below are painpoints specific to the current GE product: • GE currently supports two distinct EMS product lines, and to date has not provided a future vision for these products. • Architecture lacks innovation and has evolved at a glacial pace. • Lacks modern visual tools and SA capabilities. • Complex to maintain due to extensibility and scalability. • Requires significant outside services and expertise investment to adequately support. • EMS support team is required to manage and maintain all EMS source-code. • Archaic User Interface – no support for dynamic object visualization, integrated storm and weather data, or geographic map overlays. • Operator training simulator is labor intensive to program and operate, making quality training expensive with long lead times to produce scenarios. • GE relies on customers to provide scoping and funding to create and incorporate the new NERC compliance initiatives. PSE needs an EMS vendor that will proactively address the evolving regulatory mandates in its product baseline. Situational Awareness: Control room SA is a topic that has gained much more attention recently in the power industry. Operators in a complex and dynamic operational environment are required to maintain a comprehensive and up-to-the-minute understanding of the system status. In this environment, PSE needs modern EMS SA tools for operators to perform their job effectively and make correct decisions. • The new NERC requirements have shifted from operating within pre-established limits to requiring entities to accurately assess current and probable conditions. The entities are required to establish clear SA tools to perform real time assessments. • The last GE EMS upgrade completed in 2019 did not address the growing needs of control room SA. • PSE’s future vendor solution will need to provide a modern platform with the enhanced SA features listed below: o Three-dimensional graphical query technology on grid visualization. o A common source which integrates multiple data layers and the ability to tailor layouts and control how information is presented. o Seamlessly integrate with all relevant EMS applications, both real-time and analytical functions, should be available from a single platform. o Display links and icons that can be personalized to meet different operators’ needs and preferences. Enhanced SA tools not only encourage operators to work more efficiently, they also allow the system to remain highly flexible as situations change. Operators can efficiently identify system abnormalities and reduce response time. Improved Vendor Partnership: We require our future EMS vendor to have a much more engaging approach towards product vision, customer focus and communication, and competitive pricing. Below are key points specific to PSE’s current EMS Vendor: • Corporate change of ownership 4 times in last 15 years. • The recent GE acquisition resulted in lack of communication and customer direction. • Very poor experience during 2019 EMS upgrade project under GE’s ownership. • Lack of platform roadmap and product vision. • Little to no utility user community to partner with and influence GE’s product roadmap. • Most expensive EMS vendor in the industry. Total Cost of Ownership Reduction: The GE total cost of product ownership is no longer competitive. • Current product upgrades are very costly, in excess of \$6M for just the GE portion of the 2019 EMS Upgrade. • Upgrades require significant time investment, in excess of 20 months from planning to cutover of the 2019 EMS Upgrade. This represents a significant internal cost burden to PSE. • Total cost of ownership reduction is directly related to the frequency of scheduled upgrades, delivery and implementation timeline, and contractor rates. GE is no longer competitive in any of these areas. • PSE has conducted an independent total cost of ownership study of an alternative vendor and has determined significant cost savings are possible. PSE is aware of many utilities who have migrated to other EMS vendors with great success. The Load Office proposes to replace the aging GE EMS and switch to a EMS vendor that can bring modern operations technology solutions to our critical control room.



EMS Platform Replacement

Corporate Spending Authorization (CSA)

Desired State (Proposed Solution):

Replace the legacy GE EMS with a modern EMS platform transitioning to an entirely new integrated energy management software ecosystem. Engage contractor resources from a selected vendor to team with PSE to initiate the platform migration as well as analyze the hardware needs. PSE will also hire a consultant integrator who has executed a GE conversion to the respective new EMS to provide a more seamless transition for PSE.



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Outcome/Results
(What are the
anticipated benefits):

The EMS Platform Migration project is envisioned to replace our legacy GE platform with a modern, advanced EMS. This will improve our operational capabilities and ease maintenance by simplifying the underlying architecture and introducing new functionality, such as:

- Turn-key product and patch releases with vendor managed source code.
- Simplified modern architecture that will rapidly evolve to address PSE requirements and NERC growth.
- Superior UI with significant visual enhancements and graphical features.
- Greatly enhanced User Agency.
- Improved SA and comprehensive SA tools.
- Powerful operator training simulator to better represent real-time scenarios.
- Light-weight web-based user interface for non-transmission corporate users.
- Simplified database management and improved release efficiency.
- Improved upgrade frequency and patch management.
- Significant reduction in total cost of ownership.
- Improved relationship with EMS vendor.



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Dependencies: No

Dependencies comment: None.

Escalation Included: No, escalation has not been included.

Total Estimated Costs: \$30,000,000

Estimated Five Year Allocation:

| Funds Type | ID | Line Item Description | Previous Years Actuals | Fiscal 2024 Requested | Fiscal 2025 Requested | Fiscal 2026 Requested | Fiscal 2027 Requested | Fiscal 2028 Requested |
|--|--------------------|--------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| O&M | PRJ_000492 | OM | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Capital | W_F.10002.01.21.01 | EMS Platform Replacement | \$ - | \$ 13,400,000 | \$ 10,000,000 | \$ 4,000,000 | \$ - | \$ - |
| Capital | PRJ_000492 | OM | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| *Amounts do not include escalator | | | * These amounts | | | | | |

Incremental O&M: Both

Qualitative Benefits:

Soft Benefits:
 1.Improve operational efficiency
 2.Improve Situational Awareness Capabilities
 3.Improve vendor engagement
 4.Increase frequency of software upgrades
 5.Reduce EMS operational complexity
 6.Reduction in Maintenance and Upgrade Cost

Quantitative Benefits:

| Quantitative Benefits | Benefit Type | Previous Years | Fiscal 2023 | Fiscal 2024 | Fiscal 2025 | Fiscal 2026 | Fiscal 2027 | Fiscal 2028 | Remaining Costs | Life Total |
|-----------------------|--------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------|
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Risk Summary:

Following are some of the major risks which drives a need for the upgrade to be complete during the first part of 2026. • Microsoft Extended warranty ends in October 2026 • GE's custom support for their software ends in December 2026 • Control Center Move from ESO to its new location is scheduled for late 2026, and customer needs 6 months of stability and use of system prior to moving.



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Change Summary:

| Planning Cycle | Change Summary | Last Update Date |
|---------------------|--|------------------|
| 2022 Baseline Cycle | This CSA has been migrated into the EPPM tool at go-live as part of the Phase 1 EPPM implementation effort. The projects in this CSA were previously approved for the 2023-2027 capital plan. Please refer to the original CSA document for additional information (if available.) | 2/10/2023 |
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EMS Platform Replacement Corporate Spending Authorization (CSA)

Approval History:

| Approved By | Date Approved |
|---|---------------|
| Approved by Cost Center Owner: Sorrell, Evan | 3/31/2023 |
| Approved by Director Sponsor: Fellon, Brian | 4/3/2023 |
| Approved by Director Sponsor: Murphy, Ryan | 4/7/2023 |
| Approved by Executive Sponsor: Koch, Dan | 4/20/2023 |
| Approved by Cost Center Owner: Sorrell, Evan | 5/1/2023 |
| Approved by Cost Center Owner: Panchapakesan, Deepa | 5/4/2023 |
| Approved by Director Sponsor: Murphy, Ryan | 5/5/2023 |
| Approved by Director Sponsor: Fellon, Brian | 5/9/2023 |
| Approved by Executive Sponsor: Koch, Dan | 5/9/2023 |
| Approved by Executive Sponsor: Upton, Simon | 5/15/2023 |
| CSA Status changed to Approved | 5/15/2023 |
| Approved by Cost Center Owner: Gill, Satinder | 12/4/2023 |
| Approved by Director Sponsor: Gill, Satinder | 12/4/2023 |
| Approved by Executive Sponsor: Gill, Satinder | 12/4/2023 |
| CSA Status changed to Approved | 12/4/2023 |
| Approved by Cost Center Owner: Panchapakesan, Deepa | 1/27/2024 |
| Approved by Director Sponsor: Fellon, Brian | 1/27/2024 |
| Approved by Director Sponsor: Murphy, Ryan | 1/27/2024 |
| Approved by Executive Sponsor: Vargo, Michelle | 1/29/2024 |
| Approved by Executive Sponsor: Upton, Simon | 1/30/2024 |
| CSA Status changed to Approved | 1/30/2024 |
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