PUGET SOUND ENERGY

Capital Spending Authorization Summary

Project owner name: ***Kurt Palmer*** **Business Unit:** ***IT Infrastructure***
Date completed: **Operational Program**: *New Backup Data Center*
Date when the CSA will be completed: 5/29/2015

1. Problem to be solved, condition to improve, or capabilities desired:

PSE currently operates and maintains four Data Centers:

- *EST 2nd floor serves as our Resiliency Center (Backup Control Center) and Backup Data Center*
- *PSE 9th floor supports Trade floor and Phone system (Rolm and VOIP). We also have approximately 234 Telco circuits going out at this Data Center supporting other PSE locations.*
- *ESO supports critical communication that supports System Ops/Load Office along with Gas Operations*
- *Bothell H serves as our main Production Data Center*

Network Operations Center is located in Bothell H and monitor's PSE's IT Production Systems 24x7.

Data Center Limitations:

- *All have limited/costly expansion or load capability limitations*
- *All are located within the I-405 corridor and earthquake fault line*
- *All are located within 12 miles of one another*
- *None were built to allow concurrent maintenance – today we cannot shift load from Production Data Center to our Backup Data Center*
- *All have inherent risks that prevent PSE from providing adequate redundancy*
- *Both Bellevue Data Centers are in leased office locations not built for Data Center Infrastructure*
- *Bellevue Backup Data Center Infrastructure has very limited room to expand and grow to support the Business Continuity and DR initiatives*

In order to meet the business critical needs, technology and business recovery, growth and planned technology deployment including Business Continuity and DR over the next five to ten years PSE must replace our current Backup Data Center in Bellevue EST location. Our critical business systems today like: EMS, GAS, OMS, PSE.com are expected to be available, reliable and secure 24X7 and we are at risk in not being able to recover and support 24X7 availability in our current Backup Data Center if and or when a Disaster occurs.

Planning in 2016 will include assessment of a Resiliency Center, the high-level estimated costs included in this document is just for the new Backup Data Center. Corporate Facilities has ear-marked estimated budget for the Resiliency Center and property if not currently owned by PSE.

See Appendix: Table outlines - Data Center Best Practice criteria which includes DR/Backup , identify gaps in Best Practice and measures how gaps impact PSE. Goal is the maintain critical applications, system reliability, redundancy which allows us if needed to fail over to a Backup Data Center in a Disaster, scheduled maintenance and outages (if required) which reduces downtime, ensure safety and secure systems – protect PSE's data, information, IT assets and business applications.

2. With what Integrated Strategic Plan (ISP) objective and strategy does this align and how is efficiency gained? Consider the strategic measurement that will be impacted.

This would support the financial, and process and tools, mandatory and corporate risks objectives of the ISP.

ISP Objectives, Mandatory and/or Corporate Risk	**Strategy** *Abbreviated ISP strategy descriptions*	**Benefit Description** *Benefit, measurement and/or scorecard affected*
Safety	☐ Educate and train employees on effective safety and wellness strategies	
People	☐ Develop/Retain best employees ☐ Ownership, innovation and continuous improvement	
Process and Tools	✓ ☐ Effectiveness and efficiency ✓ ☐ System reliability and integrity ✓ ☐ Safety and security of systems, information and assets ☐ Extract and leverage value from existing technology and assets	
Customer	☐ Customer Experience Intent Statement ☐ Recognition of PSE role in community ☐ Ideal customer behavior	
Financial	✓ ☐ 5-year Strategic Plan ☐ Long-term value ☐ Grow core business ☐ Grow new business	
Mandatory	☐ Regulatory body ☐ Internal audit finding ✓ ☐ Business continuity	
Corporate Risk	✓ ☐ Corporate risk	*Business Continuity*

3. Cost and duration

IT CSA Summary Financial template.xls

Line #	Lifecylce Phase	Start	Finish	2016				2017				2018	
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1	Planning -Backup Data Center	1/1/2016	6/29/2016										
2	Design – Backup Data Center	7/1/2016	12/30/2016										
3	Implementation – Backup Data Center	1/2/2017	12/29/2017										

4. Change Management

All business applications will have validation tasks to ensure their system, data and transactions have backed up successfully from the Bothell Production Data Center to the new Backup Data Center.

5. Sign-Off

Signer	Title	Date	Signature
Carolyn Danielson	Manager – IT Facility Infrastructure		
Jason Shamp	Manager – Enterprise Systems		
Kurt Palmer	Director of IT Infrastructure		
Margaret Hopkins	CIO		

Appendix

Data Center Infrastructure Analysis

Goal: Maintain critical application availability; scheduled outages drive downtime

Methodology to achieve goal: **(1)** Identify Best Practice criteria; **(2)** Identify gaps in Best Practice; **(3)** Measure how gaps impact PSE

Best Practice Categories	**(1)** Best Practice Criteria	**(2)** Does PSE align with Best Practice? Y=yes; N=no	**(3)** Gap assessment level of impact (H= High; L=Low)				Comments
			Production Data Center	ESO Data Center	9th Floor PSE Data Center	Backup Data Center	
Location	Located outside a seismic zone	N	H	H	H	H	None of these locations meet seismic "Fully Operational" Standards
	Located outside a flood zone	N	H	L	L	L	Bothell Data Center could not be retrofitted to avoid flooding
	Locations cannot be affected by same event	N	H	H	H	H	An earthquake can affect all buildings
Ownership	Control of data center space is Best Practice	N	H	L	H	H	PSE only owns ESO facility
Life Span	Average Data Center life span is 10 years	N	L	H	H	H	Industry average
Structural	Floor loading supports equipment weight	N	H	L	H	H	Bothell and BUCC have floor loading limits preventing optimal utilization
	Located on ground floor	N	H	H	H	H	
Mechanical	Cooling systems support design configuration	Y	L	H	H	H	Water supply for cooling system has single source. Bothell DC is best practice.
	Cooling systems includes N+1 redundancy	N	L	H	H	H	Additional Cooling equipment would need to be added to each site to increase redundancy.
Electrical	(UPS) uninterruptible power supplies include N+1 redundancy	N	L	L	L	H	BUCC has single power path from P-1 UPS Room to EST-02
	DC/AC sources of power available	Y	L	L	L	L	
	Backup generations provide N+1 redundancy	N	L	H	H	H	Single generator for ESO, PSE-09, BUCC
Fire	Fire suppression systems functional	Y	L	L	L	L	
	Fire monitoring systems functional	Y	L	L	L	L	
Receiving	Loading dock, including staffing, supports 24x7 operations	N	H	H	H	H	
Elevators	Freight elevators available if data center not	N	H	L	H	H	