BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

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WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,	**DOCKET NO. UE-060266**
Complainant,	**DOCKET NO. UG-060267**
v.	
PUGET SOUND ENERGY, INC.	
Respondent.	

EXHIBIT TO DIRECT TESTIMONY OF

STEPHEN G. HILL

ON BEHALF OF STAFF OF WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Gas Utility Margin Volatility

July 25, 2006

PUGET SOUND ENERGY

GAS UTILITY REVENUE MARGIN VOLATILITY

All data from Amen Workpapers 020906.xls
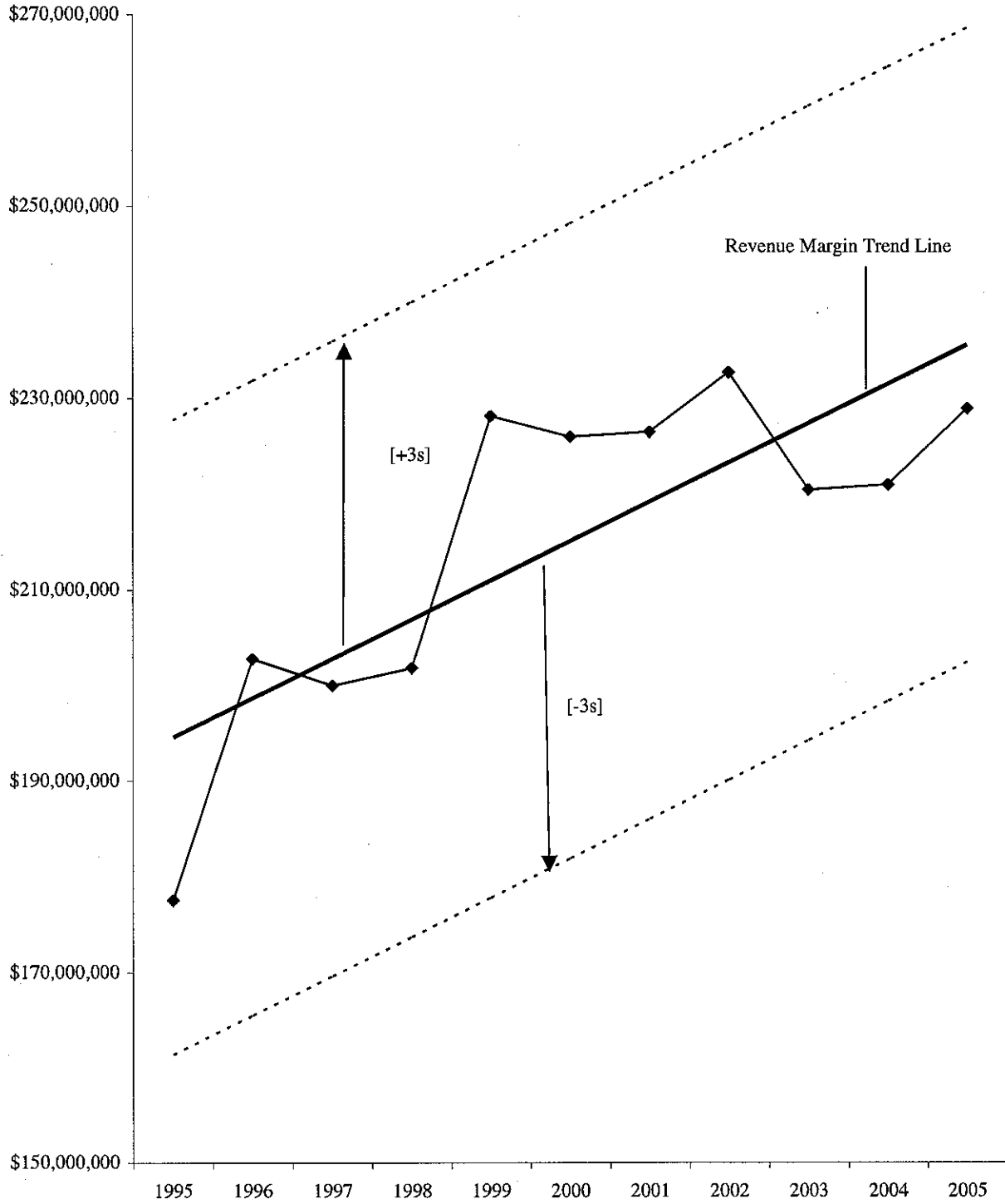
PUGET SOUND ENERGY
REVENUE MARGIN TRENDLINE CALCULATION

YEAR	X	Y Margin Revenues	x (X-Xavg.)	y (Y-Yavg)	x squared	xy	y squared
1995	1	$177,574,906	-5	-$37,481,717	25	$187,408,586	1.4049E+15
1996	2	$202,777,679	-4	-$12,278,944	16	$49,115,777	1.5077E+14
1997	3	$199,975,893	-3	-$15,080,730	9	$45,242,191	2.2743E+14
1998	4	$201,795,585	-2	-$13,261,038	4	$26,522,076	1.7586E+14
1999	5	$228,149,366	-1	$13,092,743	1	-$13,092,743	1.7142E+14
2000	6	$225,977,009	0	$10,920,386	0	$0	1.1925E+14
2001	7	$226,464,778	1	$11,408,155	1	$11,408,155	1.3015E+14
2002	8	$232,683,051	2	$17,626,428	4	$35,252,856	3.1069E+14
2003	9	$220,403,232	3	$5,346,609	9	$16,039,826	2.8586E+13
2004	10	$220,928,689	4	$5,872,066	16	$23,488,263	3.4481E+13
2005	11	$228,892,667	5	$13,836,044	25	$69,180,219	1.9144E+14
Sum	66	2365622855			110	450565206	2.94495E+15
Average	6	215056623.2					

slope (b) = (Σxy)/(Σx-squared) =	4096047.327	
intercept (a) = Yavg - (b) Xavg =	190480339.2	
r squared = b(Σxy)/(Σy squared)=	0.626678279	

		25% Variance
variance of y given x - (1/(n-2))(Σy squared - bΣxy)		
variance of y given x =	1.22157E+14	3.05393E+13
standard deviation of y given x = $\sqrt{}$(variance of y given x)		
standard deviation of y given x = $\sqrt{}$(1.22157E+14)		
standard deviation of y given x =	$11,052,470	$5,526,235
3 standard deviation units =	$33,157,411	$16,578,706

Reference: Hemptober, et al, Statistical Inference for Mangement and Economics, Allyn and Bacon, 1975, pp. 284-287.

PUGET SOUND ENERGY
REVENUE MARGIN SENSITIVITY ANALYSIS
1995-2005

Assume: Variance of Revenue Margin Following Decoupling is 25% of Pre-decoupling Level.

1) Annual Revenue Margin (from Exhibit__(SGH-18), p. 2)

$\sigma = \$11,052,470$	σ = one standard deviation unit (historical)
$3\sigma = \$33,157,411$	3σ = 3 standard deviation units (historical)
$3\sigma* = \$16,578,706 = 1.50\sigma$	$3\sigma*$ = 3 standard deviation units (25% variance)

2) Probability (p) Difference Between 3 Standard Deviation Units (Historical), and
    3 Standard Deviation Units (Variance Reduced to 25%)

$p(3\sigma) =$	0.49865
less $p(3s*) = 1.50\sigma =$	0.43319
	0.06546 or 6.546% of average revenue margin

3) Basis Point Impact of a 6.546% Reduction in Annual Revenue Margin

a) Average Revenue Margin 1995-2005	$215,056,623
	x 0.06546
Annual Average Revenue Margin Reduction	$14,077,607

b) Company Requested Rate Base	$4.2 Billion
Common Equity Ratio	43%
A 1% Equity Return Reduction	=(1% x 43% x $4.2 B)/(1-34%)
	= $27.363 Million

c) If 1% ROE Change Affects Annual Revenues by $27.363 Million,
    Then, a $14.077 Million Reduction is Equivalent to a 0.51% Change In ROE

$14.077M ÷ $27.363M = 51.44%

Historical Data from Company Witness Amen's Workpapers.
Probability Table Data From: Hemptober, et al, Statistical Inference for Mangement and Economics,
Allyn and Bacon, 1975, appendix, Table II, "Areas of the Standard Normal Distribution."