

**EXHIBIT NO. ___(DEM-3C)
DOCKET NO. UE-14 ___
PCA 12 COMPLIANCE
WITNESS: DAVID E. MILLS**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**In the Matter of the Petition of
PUGET SOUND ENERGY, INC.
For Approval of its March 2014 Power Cost
Adjustment Mechanism Report**

Docket No. UE-14 ___

**SECOND EXHIBIT (CONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF
DAVID E. MILLS
ON BEHALF OF PUGET SOUND ENERGY, INC.**

**REDACTED
VERSION**

MARCH 31, 2014

PUGET SOUND ENERGY, INC.

**SECOND EXHIBIT (CONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF DAVID E. MILLS**

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**REDACTED
VERSION**

PUGET SOUND ENERGY, INC.

**ILLUSTRATION OF PSE'S PORTFOLIO AND
RISK MANAGEMENT ACTIVITIES FOR PCA PERIOD 12 POWER
SUPPLY FOR THE SINGLE MONTH JUNE 2013**

I. PUGET SOUND ENERGY'S HEDGING PLAN

The purpose of this exhibit is to illustrate the manner in which Puget Sound Energy, Inc. ("PSE") manages its electric portfolio, including risk management activities, by describing how PSE managed power supply and costs for a single month during Power Cost Adjustment Mechanism ("PCA") Period 12: June 2013.

In accordance with PSE's Energy Risk Policy, the Energy Management Committee ("EMC") is responsible for providing policy-level and strategic direction on energy supply portfolio risk issues and significant new long-term resources and contracts. Power and Gas Supply Operations Staff ("Staff") follow the EMC approved Programmatic Hedge strategy to guide them in the specific time periods and quantities of energy to hedge. PSE manages its short-term energy supply hedging and portfolio risk activities in accordance with the EMC-approved Energy Supply Hedging & Optimization Procedures Manual ("Procedures Manual"). In addition, the Audit Committee of PSE's Board of Directors provides oversight of these activities in accordance with PSE's Energy Risk Policy.

On July 22, 2004, the EMC approved the original programmatic hedging strategy, with a Staff transactional purview of [REDACTED]. The programmatic hedge strategy authorizes Staff to use a dollar cost averaging informed by Margin at Risk ("MaR") analysis, with defined minimum and maximum monthly exposure limits. *See* Exhibit No. ___(DEM-5C) for a PowerPoint presentation on MaR. This hedging plan increases

1 Staff's ability to react to position changes such as those due to stream or hydro flow
2 variation, forced thermal plant outages and changing market conditions.

3 The term of the EMC approved strategy, known as the "Programmatically Managed
4 Hedge" period, consisted of the last [REDACTED] of the [REDACTED] purview - this was also
5 known as the "Rolling [REDACTED] Hedge". The first [REDACTED] (current month plus the
6 following [REDACTED]) of the [REDACTED] purview were actively managed ("Actively
7 Managed Hedge") in accordance with the Procedures Manual.

8 On January 7, 2006, the "Rolling [REDACTED] Hedge" was amended to be a "Rolling
9 [REDACTED] Hedge" and the Actively Managed Hedge was extended to include the current
10 month plus the next [REDACTED]. In October 2007, consistent with PSE's benchmarking of
11 hedging best practices and market research efforts tailored to measure the value of energy
12 commodity hedging to customers, PSE extended its hedging tenor from [REDACTED] to [REDACTED]
13 [REDACTED]. At that time, the first [REDACTED] of this period became the Actively Managed Hedge
14 period and the remaining [REDACTED] through [REDACTED]) became the
15 Programmatically Managed Hedge period in accordance with the EMC approved strategy.
16 The Programmatically Managed Hedge period is currently referred to as the "Rolling [REDACTED]
17 [REDACTED]" hedge but it can extend through [REDACTED] to include hedging with power
18 only (not gas) for a full calendar quarter. Since power is not liquidly traded on a monthly
19 basis beyond the first 12 months, the Programmatically Managed Hedge ends with a full
20 calendar quarter. For example, when the month of April rolls into the strategy as [REDACTED],
21 the months of May and June also roll into the strategy, as [REDACTED], to have a
22 complete quarter for purposes of hedging power. If Staff elects to hedge [REDACTED] by
23 purchasing power, then power is purchased for the entire quarter. However, if Staff elects

1 to hedge by purchasing gas, then gas is purchased for that month only. The
2 Programmatically Managed Hedge is designed to reduce PSE's net power portfolio
3 exposure starting [REDACTED] in advance of delivery, subject to minimum and maximum
4 exposure reduction, based upon a fundamental view, and is intended to remove commodity
5 price volatility.

6 All of the transactions for the "sample PCA month" (June 2013) were executed after
7 the extension of the hedging strategy and many were transacted more than [REDACTED] prior
8 to delivery. Transactions within [REDACTED] of delivery fall within the Actively Managed
9 Hedge period and are primarily shorter-term balancing transactions to respond to changes
10 in market heat rates, customer demand, current hydro conditions, unit assumptions and
11 other variables.

12 The Programmatically Managed Hedge is designed to reduce the power portfolio's
13 total net exposure for each month, so that the total net exposure will fall below the EMC
14 exposure limits set forth in the Procedures Manual. The "maximum" monthly hedge for the
15 Programmatic Managed Hedge is calculated by dividing the total net exposure by the
16 remaining months prior to the time when the position falls into the Actively Managed
17 Hedge term. The "minimum" monthly hedge is calculated by dividing the total net
18 exposure (plus or minus the Director's limit authority) by the remaining months prior to the
19 time when the position falls into the Actively Managed Hedge. However, since the Rolling
20 [REDACTED] hedge always ends on a quarter to allow for purchasing the more liquid quarterly
21 power products, the minimum limit is zero for [REDACTED] [REDACTED] so that if Staff elects to
22 hedge by purchasing gas, there is no requirement to remove exposure for [REDACTED]
23 [REDACTED]. The "mid-point" monthly hedge is the average of the "maximum" and the "minimum"

1 monthly hedge amounts. If such a month's position already falls within the Director's
2 exposure limit authority, there is no monthly hedge requirement. As defined in Schedule F
3 of the Procedures Manual, "Spot Market Exposure for Gas and Power Portfolios", the
4 Director has exposure authority up to the CFO/CRO level (\$ [REDACTED] monthly or \$ [REDACTED]
5 [REDACTED] for the rolling [REDACTED] period). Spot market exposure above the CFO/CRO level
6 requires notification to the EMC. See Exhibit No. ___ (DEM-10C) for the Schedule F
7 excerpt from the Procedures Manual.

8 During the Actively Managed Hedge period, Staff manages the monthly net
9 exposure in accordance with the Procedures Manual. The exposure is calculated
10 individually for peak, off-peak, and gas for power positions. The authority limit is
11 calculated on the net spot exposure of all three positions. Spot market exposure is
12 measured by multiplying the open position by the hourly spot price.

13 Margin at Risk measures risk reduction as a result of incremental hedging. As
14 PSE's hedging strategy evolved, the MaR concept was added to the evaluation process in
15 May 2004 for the Programmatically Managed Hedge strategy to measure risk reduction for
16 various alternatives. MaR analysis shows how much risk reduction is gained by month and
17 by strategy – providing an additional tool to determine which commodity is the best choice
18 and for which month given a credit-constrained environment. The MaR calculation shows
19 the amount of portfolio risk removed for each hedging dollar spent when 25 MW of on-
20 peak or off-peak power or 5,000-MMBtu/day of gas is transacted as these represent typical
21 volumes for market transactions.

22 The remainder of this report will illustrate the systems and tools used by Staff and
23 their application for PCA Period 12 by describing actual hedging strategy decisions and the

1 execution thereof by PSE. Please reference section II through IV which provide a
2 summary of [REDACTED], and review the analysis and fundamental views Staff
3 relied upon to make hedging decisions for June 2013. Section V provides a description of
4 the exhibits, Exhibit No. ___(DEM-4C) through Exhibit No. ___(DEM-13C), which
5 provide additional detail supporting this narrative.

6 **II. PROGRAMMATICALLY MANAGED HEDGE PERIOD**

7 **A. [REDACTED] THROUGH [REDACTED]**

8 In [REDACTED], the entire [REDACTED] rolled into
9 Staff's Programmatically Managed Hedge purview. Therefore, June 2013 was within the
10 Programmatically Managed Hedge strategy. At the beginning of [REDACTED], the position
11 report indicated the June 2013 net exposure was [REDACTED] with a [REDACTED] MW on-peak
12 power [REDACTED] position, a [REDACTED] MW off-peak power short position and a [REDACTED] MMBtu/day
13 natural gas [REDACTED] position. The then current portfolio position indicated that the on- and
14 off-peak power positions, valued at the then current market price, resulted in an on- and
15 off-peak power exposure of [REDACTED] and [REDACTED], respectively. This power
16 exposure, combined with the [REDACTED] natural gas exposure totaled a net exposure of
17 [REDACTED]. See Exhibit No. ___(DEM-4C) for the June 2013 exposures over the
18 entire hedging period.

19 The "maximum" monthly reduction in exposure yet to be accomplished by Staff is
20 the net exposure noted above divided by the remaining months prior to the time when the
21 position falls into the Actively Managed Hedge. In May 2010, with [REDACTED] remaining
22 before June 2013 fell into Staff's Actively Managed Hedge, the maximum monthly

1 reduction was \$ [REDACTED]). Since June 2013 is month 25, and
2 Staff is not obligated to remove exposure for months 24 and 25, the "minimum" reduction
3 is zero (as explained above). The "mid-point" reduction, or the average of the "maximum"
4 and "minimum" amounts, is [REDACTED].

5 In early [REDACTED], as part of the Programmatically Managed Hedge, Staff reviewed
6 market fundamentals and came up with a hedging strategy for the [REDACTED] through June
7 2013 time frame. Given the April 2010 British Petroleum oil spill in the Gulf of Mexico,
8 forecasts for a hot summer and an above normal hurricane season, both the Henry Hub and
9 regional gas prices were up. However, industrial demand remained muted and natural gas
10 production was on the rise, creating an over-supply situation. Staff elected to hedge to
11 maximum for the Programmatically Managed Hedge. As a result, Staff reduced the total
12 net exposure for June 2013 by [REDACTED] million by purchasing [REDACTED] MW of on-peak power and [REDACTED]
13 MW of off-peak power for the entire second quarter of 2013. Often the tenure of an entered
14 hedge transaction spans a full quarter or full calendar year due to the fact that quarterly and
15 calendar strips are much more liquid than single month markets and the pricing and volume
16 reflect the availability at that time. See Exhibit No. ___(DEM-11C) for the fundamentals
17 and Exhibit No. ___ (DEM-13C) for market prices that affected June 2013.

18 During the months June 2010 through May 2012, Staff managed the June 2013 spot
19 market exposure similar to [REDACTED] –to reduce the monthly exposures at a [REDACTED]
20 level pursuant to the Programmatically Managed Hedge strategy – with an eye towards the
21 power and natural gas market fundamentals which include water supply and weather
22 conditions.

1 In [REDACTED] PSE updated its customer load forecast to better reflect the on-going
2 economic impact to its service territory. As a result, the June 2013 demand forecast
3 increased by [REDACTED]. Staff purchased a
4 total of [REDACTED] MW of off-peak power and [REDACTED] MW on-peak power for the entire second quarter
5 of 2013, to reduce June 2013 exposure. PSE's net exposure was reduced [REDACTED] million
6 during this time.

7 In July 2010, continuing to reduce exposure at a [REDACTED] level, Staff again
8 purchased a total of [REDACTED] MW of on-peak power and [REDACTED] MW of off-peak power for the entire
9 second quarter of 2013, to reduce June 2013 exposure. PSE's net exposure was reduced by
10 \$[REDACTED] million as a result.

11 At the beginning of August 2010, looking at delivery month June 2013, PSE's MaR
12 analysis indicated that the most effective exposure reduction would be to [REDACTED] gas for
13 power. See Exhibit No. ___(DEM-6C) for the June 2013 MaR over the hedging term. For
14 example, if 5,000 MMBtu/day gas was purchased for June 2013, it would reduce risk by
15 nearly [REDACTED] for every \$100 spent or [REDACTED] for every dollar spent, compared to [REDACTED] with the
16 purchase of [REDACTED] MW of on-peak power or [REDACTED] with the purchase of [REDACTED] MW of off-peak
17 power. The MaR analysis indicated greater risk reduction would be gained from the
18 [REDACTED] of gas. Staff considers various factors in addition to the MaR when determining
19 what commodities to purchase and when. During this period of time, both the gas position
20 and the on- and off-peak power positions were short. However, volumetrically, the on-
21 peak and off-peak power positions were significantly shorter than the gas position. For
22 example, beginning [REDACTED], the gas exposure was [REDACTED] MMBtu/day
23 [REDACTED] compared to the [REDACTED] on-peak and [REDACTED]

1 off-peak power short positions. Therefore, in [REDACTED], Staff planned to [REDACTED]
2 [REDACTED] power for June 2013. Also during [REDACTED], PSE added Phase 1 of the Lower
3 Snake River Project (“LSR”) 340 MW capacity wind resource to its position, resulting in
4 increased generation of 113 aMW in June 2013. During this month, Staff purchased [REDACTED]
5 MW of on-peak power and [REDACTED] MW of off-peak power for the entire second quarter, to
6 reduce June 2013 exposure. Staff also purchased 2,500 MMBtu/day of gas. These
7 purchases, along with the addition of LSR’s forecast generation, reduced total net exposure
8 by [REDACTED] million.

9 During the months of September 2010 through May 2012, Staff continued to ratably
10 decrease June 2013’s net exposure and [REDACTED] an additional [REDACTED] gas
11 for power, [REDACTED] MW of on-peak power and [REDACTED] MW of off-peak power which, when
12 combined with the continued decline of market prices, reduced June 2013’s net exposure to
13 [REDACTED]. By the end of May 2012, when June 2013 was to roll into the actively
14 managed hedging period, PSE was [REDACTED]

15 [REDACTED]

16 **III. ACTIVELY MANAGED HEDGING PERIOD**

17 In [REDACTED], June 2013 rolled into Staff’s Actively Managed Hedge. This allowed
18 Staff to more actively manage the June 2013 position for a full [REDACTED] prior to
19 delivery. At the beginning of June 2012, the position report indicated the June 2013 net
20 exposure was long [REDACTED] with a [REDACTED] or [REDACTED] MW on-peak power long
21 position, a [REDACTED] or [REDACTED] MW off-peak power [REDACTED] position and a [REDACTED] or
22 [REDACTED] MMBtu/day natural gas short position. See Exhibit No. ___(DEM-4C) for the June

1 2013 exposures over the hedging period. At that time, market implied flat heat rates for
2 June 2013 were averaging around [REDACTED], a level where none of PSE's gas-fired
3 generators were forecast to be economically dispatched, causing a greater power demand
4 and a longer gas position. See Exhibit No. __ (DEM-12C) for the daily heat rate trends for
5 June 2013. The total net exposure was [REDACTED]
6 [REDACTED]. Given the near flat position for the power book, Staff chose, at
7 that time, to [REDACTED]. In late June 2012, Colstrip minimum uptime and
8 minimum capacities were updated in the position model resulting in less coal generation
9 annually during the months of March through July. Therefore, on-peak and off-peak power
10 positions got shorter.

11 Moving into the [REDACTED], the near term market was focused on the ongoing
12 tightening of the once large year over year natural gas storage surplus and the potential
13 impacts of the coming winter. Because October is the beginning of the water year, the
14 January through July 2013 Grand Coulee runoff is forecast to be normal. In late October
15 2012, market heat rates were down which resulted in short peak and off-peak power
16 positions. Staff purchased [REDACTED] MW of off-peak power for June 2013 delivery by purchasing
17 the entire second quarter.

18 In [REDACTED], Staff added the 273 MW capacity Ferndale gas-fired generation
19 resource acquisition to its portfolio and modeled position with a dispatch heat rate of [REDACTED]
20 Btu/kWh. Market heat rates for June 2013 at that time were below the dispatch heat rate of
21 the Ferndale plant so the modeled probabilistic on-peak power position increased only 16
22 aMW. During the month of November, Staff [REDACTED] MW of on-peak power and [REDACTED]

1 MW of off-peak power for June 2013 delivery, by [REDACTED], in
2 an effort to remove exposure.

3 In [REDACTED], June 2013 Mid-C flat power prices had declined nearly 30% in
4 a four month period falling from \$13.88 in late August to \$9.82 in late December with
5 hardly a move in gas prices. As heat rates decreased, the power open position continued to
6 get [REDACTED]. Staff elected to remove a portion of the power exposure at the lower market
7 power prices. Near the end [REDACTED], Staff [REDACTED] MW of on-peak and
8 [REDACTED] MW of off-peak power for the entire second quarter to [REDACTED] the June 2013 power
9 [REDACTED] position.

10 By mid-February 2013, the January through July runoff forecast at Grand Coulee
11 had decreased to 88 percent of normal. As a result, market heat rates increased, causing the
12 on-peak power position to go from a small short to a small long position.

13 In May 2013, with June 2013 as the prompt month, in addition to the probabilistic
14 modeled position, PSE also considered a [REDACTED] position for June 2013 set-up. In
15 early May 2013, the January-July forecast for outflows at Grand Coulee had rebounded to
16 slightly above normal. At the same time, the weather forecasts for the Pacific Northwest
17 (“PNW”) were calling for below normal temperatures for June 2013 with below normal
18 precipitation, which provided some support to both the June 2013 power and gas prices.
19 Hydro capacity at Grand Coulee was substantially lower due to unit outages which had
20 been providing support to the cash and real-time power markets. It was unknown when the
21 units would return to service. By mid-May 2013, weather forecasts for the PNW had
22 warmed and were showing normal temperatures for June. Power prices for June 2013 had
23 been on the rise and as a result, on-peak heat rates increased from a four month average of

1 [REDACTED] (a heat rate level where none of PSE’s gas-fired generators may be economically
2 dispatched) to the mid-[REDACTED] level (where several of PSE’s gas-fired units may be
3 economically dispatched). During May 2013, PSE [REDACTED] a total of [REDACTED] MW of on-peak
4 power, [REDACTED] MW of off-peak power and [REDACTED] MMBtu/day of gas for June 2013
5 delivery. Within those transactions, Staff sold an 8,343 on-peak heat rate by [REDACTED]
6 MW on-peak power at Mid-C and purchasing [REDACTED] MMBtu/day gas at Sumas. Staff also
7 sold an 8,715 on-peak heat rate by selling [REDACTED] MW on-peak power at Mid-C and purchasing
8 [REDACTED]/day gas at Sumas. Prior to May 2013, when market power prices were
9 lower, the Colstrip units were not in-the-money which reduced forecast coal generation,
10 exacerbating our short power position. During May 2013, however, as prices exceeded the
11 incremental generation rate of the Colstrip units, forecast coal generation increased,
12 resulting in substantially more power. Staff monetized this increase in power generation
13 which caused a long position by selling [REDACTED] MW of off-peak power. At the end of May
14 2013, due to an increase in market heat rates, the net exposure for June 2013 was [REDACTED]
15 [REDACTED] and within the Actively Managed hedging limits defined by the Procedures Manual.

IV. JUNE 2013 – WITHIN MONTH OVERVIEW

16
17 At the end of May 2013, the net exposure for June 2013 was [REDACTED], which
18 represented a [REDACTED]
19 [REDACTED]
20 [REDACTED], respectively. As PSE entered June 2013, market observers were
21 taking into consideration the weather forecasts for the remainder of the spring and summer
22 months, as above normal temperatures nationally and regionally could lead to increased

1 demand and potential price spikes. In early June 2013, weather forecasts for the West had
2 shifted to a warmer outlook with California and the Southwest at above normal
3 temperatures. Hydro capacity at Grand Coulee had increased, enabling power to be
4 generated rather than spilled, resulting in more power availability. The month began with
5 flat market heat rates at 7,688 Btu/kWh and ended with just under the 7,000 Btu/kWh level.
6 The average daily flat heat rate for the month was 7,889 Btu/kWh, with on-peak power
7 prices averaging \$32.14/MWh, off-peak power prices averaging \$20.42/MWh and the gas
8 price averaging \$3.58/MMBtu.

9 From May 2010 through May 2013, Staff purchased [REDACTED] MW of on-peak power
10 at an average price of \$[REDACTED]/MWh and [REDACTED] MW of off-peak power at an average price of
11 \$[REDACTED]/MWh. Staff also [REDACTED] MW of on-peak power at an average price of
12 [REDACTED]/MWh and [REDACTED] MW of off-peak power at an average price of \$[REDACTED]/MWh. From
13 May 2012 through May 2013, Staff purchased [REDACTED] MMBtu/day of natural gas at an
14 average price of [REDACTED]/MMBtu. Note that the majority of the power hedges were executed
15 for a full quarter or calendar strip where market liquidity is far greater than an individual
16 month. See Exhibit Nos. ___(DEM-7C) and ___(DEM-8C) for further detail of PSE's
17 hedging activities for June 2013.

18 V. SUPPORTING EXHIBITS

19 The monthly exposure for June 2013 is included in Exhibit No. ___(DEM-4C).
20 PSE's PowerPoint presentation on MaR is included in Exhibit No. ___(DEM-5C). The
21 monthly MaR analysis for June 2013 can be found in Exhibit No. ___(DEM-6C). As stated
22 previously, the MaR analysis shows how much risk reduction is gained by month and by

1 strategy – providing Staff with an additional tool to evaluate which commodity to hedge
2 given a credit-constrained environment.

3 June 2013 hedges are shown for both power and gas for power in Exhibit
4 Nos. ___(DEM-7C) and ___(DEM-8C).

5 As of the 2012 water supply season, the Northwest River Forecast Center
6 (“NWRFC”) water supply forecasting procedures changed whereby Ensemble Streamflow
7 Prediction (“ESP”) generated forecasts replaced regression-based forecasts. Water supply
8 forecasts were no longer released on a scheduled three times per month basis. The new
9 ESP forecasts are published on the NWRFC website at a minimum of once a week but may
10 be updated daily. There is no longer a NWRFC Final forecast for each month. The current
11 published forecast is designated as the NWRFC Official Forecast and is valid until it is
12 replaced with an updated forecast. The 30-year average (1981-2010), referred to as
13 "normal," for the January-July period at Grand Coulee is 59,599 KAF. The actual January-
14 July 2013 runoff was 107 percent of normal at Grand Coulee, or 63,786 KAF. A graph of
15 the NWRFC forecasts for the January through July 2013 period may be found in Exhibit
16 No. ___(DEM-9). The monthly runoff volumes at Grand Coulee for water years 2011
17 through 2013 are also shown in Exhibit No. ___(DEM-9).

18 A copy of Schedule F from the Procedures Manual, "Spot Market Exposure for Gas
19 and Power Portfolios", which provides the monthly exposure limits, is provided in Exhibit
20 No. ___(DEM-10C). Exhibit No. ___(DEM-11C) provides a summarized retrospective of
21 the market prices and fundamentals over the hedging term [REDACTED] through [REDACTED] –
22 all of which played a key role in Staff’s management of, and hedging decisions for June
23 2013. The above referenced tools, forecasts, and fundamental views were used to manage

1 the monthly spot market exposure for delivery month June 2013. June 2013 hedges were
2 executed in accordance with both the Programmatically Managed Hedge and Actively
3 Managed Hedge strategies and the hedge details are shown for both power and gas for
4 power in Exhibit No. ____ (DEM-7C).

5 Daily heat rate trends for June 2013 can be found in Exhibit No. ____ (DEM-12C), as
6 well as the dispatch heat rate of PSE's gas fired turbines. Implied market heat rates
7 fluctuate daily depending on the power and gas prices, and are part of the dispatch logic
8 used in the risk model to determine which gas fired turbines are "in the money" and may
9 dispatch economically.

10 Daily commodity prices for June 2013 are in Exhibit No. ____ (DEM-13C). This
11 chart illustrates on-peak power, off-peak power, and gas for power prices as they evolved
12 over the [REDACTED] hedging period.
13