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October 9, 2015

**VIA ELECTRONIC FILING
(WEB PORTAL)**

Ms. Carlotta S. Stauffer
Division of the Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Re: Docket No. 150001-EI

Dear Ms. Stauffer:

Florida Power & Light Company ("FPL") attaches for filing in the above docket the following documents:

1. Rebuttal testimony and exhibits of FPL witness Gerard J. Yupp
2. Rebuttal testimony and exhibits of FPL witness John J. Reed
3. Rebuttal testimony of FPL witness Terry O. Jones

Please contact me if you or your Staff has any questions regarding this filing.

Sincerely,

s/ Maria J. Moncada
Maria J. Moncada

Enclosure

cc: Counsel for Parties of Record

**BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION**

**DOCKET NO. 150001-EI
FLORIDA POWER & LIGHT COMPANY**

OCTOBER 9, 2015

**LEVELIZED FUEL COST RECOVERY
AND CAPACITY COST RECOVERY**

REBUTTAL TESTIMONY & EXHIBITS OF:

**GERARD J. YUPP
JOHN J. REED
TERRY O. JONES**

1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **REBUTTAL TESTIMONY OF GERARD J. YUPP**

4 **DOCKET NO. 150001-EI**

5 **OCTOBER 9, 2015**

6 **Q. Please state your name and address.**

7 A. My name is Gerard J. Yupp. My business address is 700 Universe
8 Boulevard, Juno Beach, Florida, 33408.

9 **Q. By whom are you employed and what is your position?**

10 A. I am employed by Florida Power and Light Company (FPL) as
11 Senior Director of Wholesale Operations in the Energy Marketing
12 and Trading Division.

13 **Q. Did you previously submit direct testimony in this proceeding?**

14 A. Yes.

15 **Q. Are you sponsoring any rebuttal exhibits in this case?**

16 A. Yes. I am sponsoring the following rebuttal exhibits:

- 17 • GJY-6: Corrected Table – OPC's 4th Set of Interrogatories
18 No. 26
- 19 • GJY-7: Corrected Responses – OPC's 12th Set of
20 Interrogatories Nos. 127 and 128
- 21 • GJY-8: Corrected Henry Hub Price and Volatility Graph
- 22 • GJY-9: Black Scholes Model Results

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- GJY-10: Annualized Volatility Comparison

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my testimony is to clarify the discrepancies related to FPL’s hedging program savings (“gains”) and costs (“losses”) that were identified in the testimony of the Office of Public Counsel (“OPC”) witness Tarik Noriega and to rebut the testimony of OPC witness Daniel J. Lawton. While witness Lawton’s testimony covers a wide array of hedging related topics, ranging from market fundamentals to volatility analyses, his assertion that gas hedging activities should be ended as a mechanism to limit gas price volatility is based largely on the recent financial impact of collective hedging results and on the speculative premise that natural gas prices and volatility have reached a level that eliminates the need for hedging.

Q. Please summarize your rebuttal testimony.

A. My rebuttal testimony shows that FPL’s natural gas financial hedging program has worked exactly as intended by the Commission and FPL to limit the volatility of fuel costs that FPL customers pay. I also show that it is unreasonable and speculative for Mr. Lawton to claim that the volatility of future natural gas prices will be so low that FPL’s hedging program should be discontinued. I show that Mr. Lawton’s focus on the general trend of declining natural gas volatility masks large swings in volatility from year to

1 year, so that it's impossible to predict from historical data what
2 volatility will be in future years. I also show that it is wrong to
3 suggest that currently low natural gas prices favor discontinuing
4 hedging. Both intuition and a well-accepted analytical methodology
5 to evaluate potential price distributions indicate that potential price
6 outcomes stretch farther to the high end of the price range than the
7 low end. This asymmetric price risk suggests that now could be an
8 especially inauspicious time to discontinue hedging. Finally, I put
9 natural gas volatility into perspective by showing that it has been
10 and remains substantially greater than the volatility in two other key
11 markets: crude oil and the S&P 500.

12

13 **CLARIFICATION OF FPL'S REPORTED SAVINGS AND COSTS**

14 **Q. Please clarify the discrepancy that OPC witness Noriega**
15 **identified on pages 16 and 17 of his testimony related to**
16 **hedging gains and losses that FPL reported in its annual**
17 **hedging filings and the response that FPL provided to**
18 **Interrogatory No. 26 of OPC's 4th Set of Interrogatories.**

19 **A.** In Interrogatory No. 26, FPL was asked to provide a table showing
20 the annual gains and losses, by commodity, for all commodities
21 FPL hedged for each of the years from 2002 through 2014. When
22 putting that table together, FPL inadvertently "double counted" the
23 cost of option premiums in the total gains and losses from 2002

1 through 2007. This error created a discrepancy with the hedging
2 activity results that FPL had filed with the Commission for that
3 same time period. The hedging activity filings properly included
4 the cost of option premiums but did not double count them, so
5 they accurately reflected the total gains and losses for those
6 years. Therefore, FPL did not “over-report gains” and “under-
7 report losses” to the Commission as described by OPC witness
8 Noriega. Rather, FPL inadvertently under-reported gains and
9 over-reported losses in its response to Interrogatory No. 26. FPL
10 is serving on OPC and all parties to this docket a corrected table
11 in response to Interrogatory No. 26, as well as to four other
12 interrogatories that utilized the incorrect data from the original
13 table. The corrected table matches FPL’s gains and losses in
14 each of its hedging filings and is included with this testimony as
15 Exhibit GJY-6.

16

17 **THE PURPOSE OF HEDGING IS TO CONTROL VOLATILITY**

18 **Q. Do you agree with OPC witness Lawton’s assertion on page 4**
19 **of his testimony that there is significant doubt as to the**
20 **benefits of fuel hedging given the historical, ongoing, and**
21 **potential financial costs to consumers?**

22 **A.** No. The primary goal of fuel hedging is and always has been the
23 reduction of fuel price volatility. The result of reducing volatility is

1 that customers will experience savings during periods of rising
2 prices and will incur costs during periods of falling prices. FPL's
3 hedging activity filings clearly demonstrate this fact. From 2002
4 through 2014, a 13-year period, FPL's natural gas hedges show
5 gains in 6 years and losses in 7 years. For the 2002 through 2013
6 time period, FPL's heavy oil hedges show gains in 8 years and
7 losses in 4 years. To determine the success of a hedging program,
8 or whether to continue a hedging program that was implemented to
9 reduce volatility, by analyzing the financial results in hindsight is
10 inappropriate and contradictory to the main purpose of hedging,
11 because it introduces speculation into the equation.

12 **Q. Has FPL's hedging program been successful in reducing the**
13 **volatility in fuel costs paid by customers?**

14 A. Yes. FPL's revised responses to Interrogatory Nos. 127 and No.
15 128 of OPC's 12th Set of Interrogatories demonstrate this fact.
16 These interrogatories asked FPL to provide the number of mid-
17 course corrections (for under-recoveries – No. 127 and for over-
18 recoveries – No. 128) that were avoided as a direct result of FPL's
19 hedging program. In response, FPL calculated the percentage, on
20 an actual basis, that it had over- or under-collected its fuel costs at
21 the end of each year. FPL then recalculated the percentage by
22 removing the impact of hedges. The results showed that over the
23 13-year period, 2002 through 2014, FPL was outside of the +/- 10%

1 mid-course correction threshold band just once with hedges
2 included but would have been outside that band 9 times with the
3 impact of hedges removed. This clearly demonstrates the
4 effectiveness of hedging as a means of reducing the volatility of fuel
5 costs. FPL's corrected responses to Interrogatory Nos. 127 and 128
6 are attached to my testimony as Exhibit GJY-7.

7 **Q. OPC witness Lawton refers to "significant losses" from**
8 **hedging numerous times in his testimony. Is this a fair basis to**
9 **assess the success of FPL's hedging program?**

10 A. Absolutely not. Judging the success of any hedging program, not
11 only in hindsight, but based on gains or losses is completely
12 inappropriate. As stated previously, the goal of FPL's hedging
13 program is to help mitigate volatility. Implementing a hedging
14 program that was designed to achieve gains relative to market
15 prices would inherently involve speculation about the movement of
16 future market prices. This is a dangerous concept, as it would
17 convert what needs to be a disciplined, well-structured program into
18 a program that has extreme variability by introducing the concept of
19 "outguessing the market".

20 **Q. Do you believe that this would be an issue if FPL's hedging**
21 **program had saved \$3.1 billion?**

22 A. No. The ironic part is that had FPL's hedging program saved \$3.1
23 billion it would have been purely by accident because reducing fuel

1 costs is not -- and cannot be – a proper goal of a hedging program.
2 FPL does not have any special insight into whether markets will
3 ultimately rise or fall in the future. While there are fundamentals that
4 drive markets, these fundamentals are subject to change.
5 Moreover, for FPL’s hedging program to have shown a gain of \$3.1
6 billion, fuel prices would have had to turn out much higher than
7 expected and FPL’s customers would have paid much more for the
8 unhedged portion of FPL’s fuel portfolio. I cannot imagine that OPC
9 would have wanted this outcome, but I also do not believe that OPC
10 would have any concerns about FPL’s hedging program if that was
11 the case.

12 **Q. OPC witness Lawton uses the terms “automatic” and “more of**
13 **the same approach” to describe the hedging programs in**
14 **Florida. What is your reaction to his characterization?**

15 A. While I believe the characterization is meant to be negative, in fact
16 he is describing exactly how a hedging program *should* work. A
17 non-speculative hedging program must be “automatic” to a certain
18 degree. FPL characterizes this as “well-disciplined”, meaning we
19 follow a well-defined process that eliminates any aspect of market
20 speculation.

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1 **Q. OPC Witness Lawton also asserts on page 23 of his testimony**
2 **that there is no analysis or basis for how the hedging**
3 **percentage is established. Is this correct?**

4 A. No. FPL's annual Risk Management Plan clearly states the
5 rationale for the amount of natural gas it hedges.

6 **Q. Do you believe that it is realistic, as witness Lawton suggests**
7 **on page 53 of his testimony, to discontinue hedging now and**
8 **revisit the topic if circumstances change "substantially" in the**
9 **future?**

10 A. No. Aside from ignoring the fact that volatility exists in the market
11 today, which I'll discuss in more detail later in my testimony, I would
12 characterize this approach as simply "chasing the market." This is
13 certainly not a sound approach for mitigating short-term volatility.
14 The approach suggests that one would know when a spike was
15 going to occur and react accordingly. What would trigger
16 reinstating hedging: a spike in prices or a gradual increase in
17 prices? And once hedging was re-instituted, would we cease
18 hedging again as soon as prices decrease? Who would be
19 responsible for speculating that the fundamentals had changed
20 "substantially" to warrant either hedging or not hedging? This would
21 not be a sound or reasonable approach to mitigate volatility, but
22 simply another misguided attempt to outguess the market.

23

1 **VOLATILITY CALCULATIONS**

2 **Q. On page 27, lines 5-8, witness Lawton describes the**
3 **methodology he used to annualize the volatility results that are**
4 **shown in Exhibit DJL-2. Is his methodology correct?**

5 A. No. As described in the U.S. Energy Information Administration
6 ("EIA") study that witness Lawton references in his testimony, "*An*
7 *Analysis of Price Volatility in Natural Gas Markets,*" volatility is
8 calculated by multiplying the standard deviation of the daily
9 logarithmic price changes for all trading days within a certain time
10 period by the square root of the number of trading days within the
11 time period. Therefore, in order to annualize the volatility result, the
12 standard deviation of the daily logarithmic price changes within the
13 year should be multiplied by the square root of the number of trading
14 days in the year.

15
16 That is not what Mr. Lawton did. The EIA study uses 252 trading
17 days to annualize volatility. According to his testimony, witness
18 Lawton annualized the volatility by multiplying the standard deviation
19 of the daily logarithmic price changes by the square root of the ratio
20 of 252 trading days by the number of trading days for the period
21 examined. He goes on to state that the number of trading days
22 employed for the annual analysis is 252 days. Therefore, in order to
23 annualize the volatility, he appears to have multiplied the standard

1 deviation of the daily logarithmic prices changes by the square root
2 of 252 divided by 252, or the square root of one. While the shape of
3 the volatility curve shown in DJL-2 is correct, the actual level of
4 volatility is incorrect. I have corrected the volatility calculation using
5 the same data that was used by witness Lawton and the corrected
6 graph is shown in exhibit GJY-8. This corrected volatility graph is in
7 alignment with the graph that was included in the EIA study for the
8 years 1997 through 2006. The final year of the EIA study was 2006.

9 **Q. Do the results change significantly when the proper calculation**
10 **is applied?**

11 A. Yes. As mentioned previously, while the general shape of the curve
12 shown in DJL-2 does not change, the magnitude of the volatility is
13 drastically higher than he calculated. For example, the annualized
14 volatility in 2014 is 96.7% -- almost *16 times* higher than witness
15 Lawton's calculation of 6.08%.

16

17 **VOLATILITY ANALYSIS**

18 **Q. What is your reaction to OPC witness Lawton's assertion on**
19 **page 28 of his testimony that annual volatility has declined**
20 **from the 2000 to 2010 period to the more recent 2011 to 2015**
21 **period?**

22 A. Mr. Lawton is correct that the general trend has been toward lower
23 average annual volatility, but this general trend masks some large

1 swings in the volatility from year-to-year. For example, the annual
2 volatility in the natural gas market for 2014 was the third highest
3 level over the last 18 years, 1997 through 2014. This level of
4 volatility followed a year, 2013, in which the annual volatility was at
5 the lowest level during the same 18-year period. The data clearly
6 shows that averaging volatility over a number of years does not
7 provide an accurate representation of the volatility that exists in the
8 natural gas market from year-to-year. The volatility increase from
9 2013 to 2014 of 65% represents the largest year-on-year increase
10 over the entire period that OPC witness Lawton evaluated, and it
11 clearly demonstrates that averaging volatility can obscure the impact
12 of price movement in the short-term.

13 **Q. OPC witness Lawton dismisses 2014 as an outlier due to**
14 **extreme weather expectations for a few days in February and**
15 **March. Is this a realistic assessment?**

16 A. No. Dismissing the impact of cold weather expectations on volatility
17 and market prices misses the entire point of hedging. The reality is
18 that cold weather expectations are a factor in driving short-term
19 market prices. In an unhedged portfolio, FPL would have paid the
20 prevailing market prices for its natural gas, including the price
21 increases that resulted from the extreme weather. This example
22 illustrates why hedging is an important tool for helping to mitigate
23 price volatility and also demonstrates why ignoring certain periods,

1 as witness Lawton suggests, could cost customers additional
2 money.

3 **Q. Do you agree with OPC witness Lawton's assertion on page 23**
4 **of his testimony that one would expect to see less hedging**
5 **with declining volatility and lower prices?**

6 A. No. First of all, I disagree with his predicate that there is declining
7 volatility. As I explained previously, while there may be a general
8 trend of declining volatility over the past several years, that trend
9 obscures some rather large swings in the level of volatility from one
10 year to the next.

11

12 Exhibit GJY-8 illustrates how it would have been impossible to
13 predict at any point over the 1997-2014 period whether the following
14 year would have low or high volatility. Just to pick a couple of
15 examples, if one had tried to predict the volatility in 2009 based on
16 the trend in the prior three years (2006-2008), one would have seen
17 a consistent trend of declining volatility and probably predicted that
18 2009 would have volatility of 40% or less. In fact, however, the 2009
19 volatility proved to be more than double that figure: 99.6%, the
20 second highest level between 1997 and 2014. Similarly, if one had
21 tried to use volatility in 2010-2013 to predict 2014 volatility, one
22 would have seen volatility in the 30%-50% range and probably

1 predicted more of the same for 2014. Instead, the 2014 volatility was
2 96.7%, the third highest value in the 1997-2014 period.

3
4 Furthermore, Mr. Lawton's assertion that one should stop hedging
5 because gas prices are low is completely counterintuitive. From a
6 logical perspective, lower prices make hedging even more valuable
7 due to the asymmetrical risks associated with price movement.
8 Prices cannot go below zero even in theory, and in reality they
9 cannot go below the variable cost of production over any extended
10 period of time. Therefore, if natural gas is expected to settle on
11 average at \$2.50 per MMBtu, the downside risk has to be less than
12 the upside risk because prices cannot go much below that average
13 and still cover the cost of production. In contrast, there is no upper
14 limit on how much *higher* prices might go from the expected \$2.50
15 per MMBtu.

16 **Q. Are there analytical methods that can be utilized to confirm this
17 intuition about asymmetrical risk?**

18 A. Yes. A common tool that is used in the commodities markets is the
19 Black Scholes model. FPL utilized the Black Scholes model to
20 generate a potential distribution of gas prices based on the current
21 expected market price and varying levels of volatility. The results of
22 this analysis are shown on Exhibit GJY-9 for several different
23 measures of volatility. To pick one such measure, Exhibit GJY-9

1 shows that, if future volatility were equal to the average over the
2 1997-2014 period of 68%, then for the current expected market
3 price of \$2.75 per MMBtu, one could be 95% confident that prices
4 would be higher than \$2.01 per MMBtu and lower than \$3.78 per
5 MMBtu. The asymmetry in this probability distribution is readily
6 apparent: the lowest probable price is only \$.74 per MMBtu below
7 the expected price, while the highest probable price is \$1.03 per
8 MMBtu higher. This difference would be substantial in terms of the
9 the highest probable gains and losses for a system the size of
10 FPL's. Using an average annual gas burn of 600 BCF that is
11 representative for FPL's system, the gain to customers from hedging
12 would be almost \$619 million at the highest probable price, whereas
13 the loss to customers from hedging would be about \$444 million at
14 the lowest probable price. Thus, because of this asymmetric
15 distribution, the "upside" of hedging in this scenario would be about
16 \$175 million more than the "downside."

17 **Q. How does the volatility in natural gas prices compare to the**
18 **volatility of other key market goods?**

19 A. Exhibit GJY-10 shows that the volatility in natural gas prices has
20 been consistently higher than the volatility of crude oil and the S&P
21 500 index. From 1997 through 2014, 18 years in total, the average
22 annual volatility of natural gas has been 68%, while crude oil and
23 the S&P 500 have averaged 37% and 19%, respectively. During

1 the last 5 years, 2010 through 2014, the time period that OPC
2 witness Lawton claims to be relevant, natural gas has an annual
3 average volatility of 53% which is almost twice as high as the crude
4 oil volatility (27%) and three and a half times higher than the S&P
5 500 (15%). Thus, while the average volatility of natural gas may
6 have decreased somewhat over the last five years when compared
7 to the previous ten years, it remains quite high relative to other
8 traded commodities and market indices.

9 **Q. Does this conclude your testimony?**

10 **A.** Yes it does.

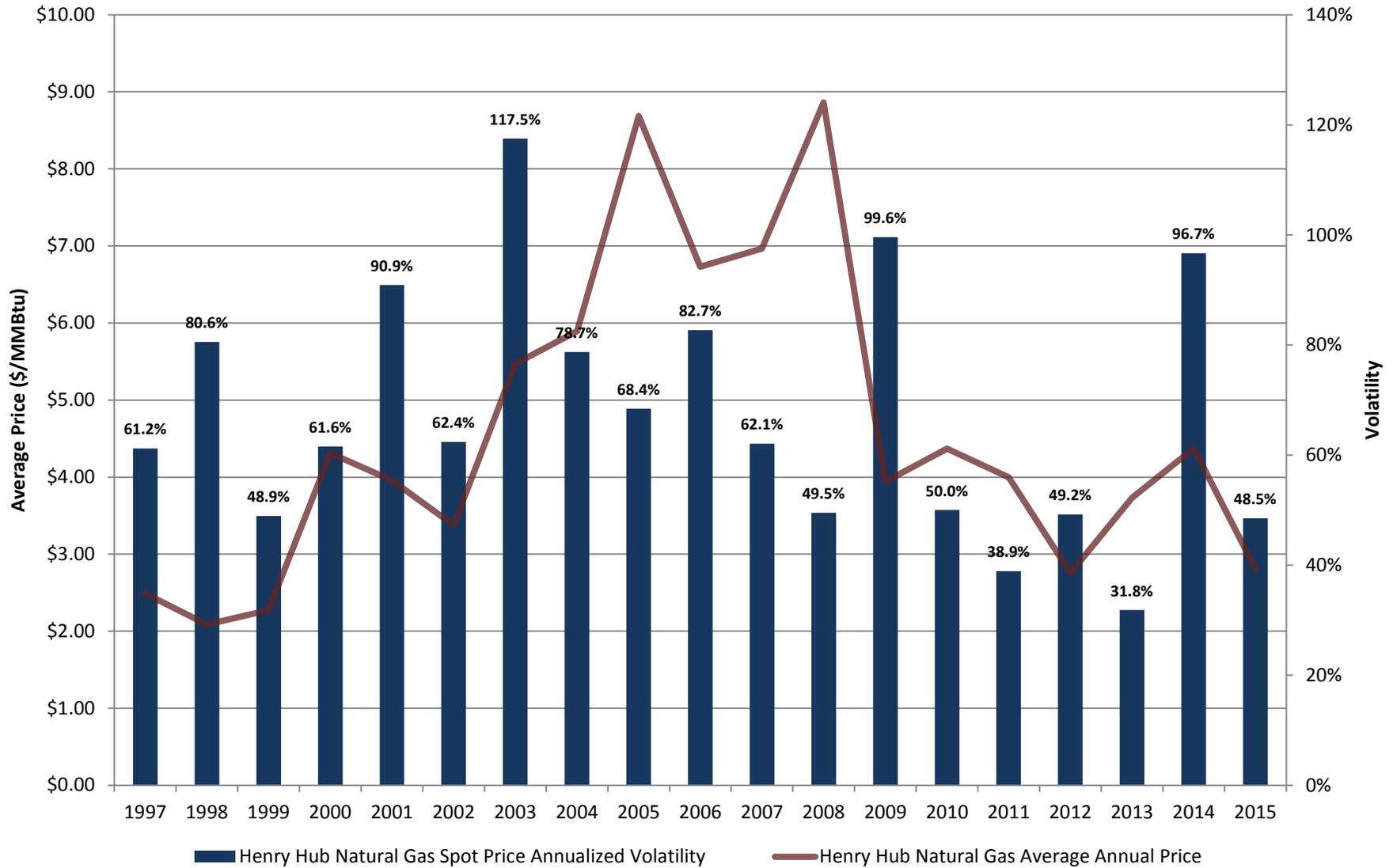
FPL HEDGING RESULTS				
	Natural Gas Gain(Loss)	Heavy Oil Gain(Loss)	Electricity Gain(Loss)	Total Hedging Gain(Loss)
2002	14,520,306	31,784,206	689,576	46,994,088
2003	(15,939,810)	26,547,034	5,094,480	15,701,704
2004	191,564,536	56,493,032	3,864,571	251,922,139
2005	519,388,788	102,249,149	3,363,088	625,001,024
2006	(416,637,197)	(52,001,140)	0	(468,638,337)
2007	(799,268,428)	(56,529,393)	0	(855,797,821)
2008	100,709,736	267,554,705	0	368,264,441
2009	(1,660,695,829)	(62,901,236)	0	(1,723,597,065)
2010	(509,147,046)	8,917,158	0	(500,229,888)
2011	(404,239,340)	16,580,894	0	(387,658,446)
2012	(671,819,795)	2,677,666	0	(669,142,129)
2013	18,253,045	(710,650)	0	17,542,395
2014	116,639,265	0	0	116,639,265

Corrected Response - Interrogatory Nos. 127 and 128 - OPC's 12th Set of Interrogatories

Final True-Up Filing Data Year	Jurisdictional Total Fuel Costs & Net Power Transactions	Jurisdictional Fuel Revenues Applicable to Period	Cumulative Monthly True-up Amount - Over/(Under) Recovery	Percent Variance	Hedging Savings/(Costs)	Revised Jurisdictional Total Fuel Costs & Net Power Transactions	Jurisdictional Fuel Revenues Applicable to Period	Cumulative Monthly True-up Amount - Over/(Under) Recovery	Percent Variance
2002	\$2,459,001,016	\$2,377,739,316	(\$81,261,700)	-3.42%	\$46,994,088	\$2,505,995,103	\$2,377,739,316	(\$128,255,788)	-5.39%
2003	\$3,444,197,949	\$3,144,836,744	(\$299,361,205)	-9.52%	\$15,701,704	\$3,459,899,653	\$3,144,836,744	(\$315,062,909)	-10.02%
2004	\$3,484,396,810	\$3,296,934,142	(\$187,462,668)	-5.69%	\$251,922,139	\$3,736,318,949	\$3,296,934,142	(\$439,384,807)	-13.33%
2005	\$4,906,808,719	\$3,879,452,165	(\$1,027,356,554)	-26.48%	\$625,001,024	\$5,531,809,743	\$3,879,452,165	(\$1,652,357,578)	-42.59%
2006	\$5,427,041,074	\$5,620,725,235	\$193,684,161	3.45%	(\$468,638,337)	\$4,958,402,737	\$5,620,725,235	\$662,322,498	11.78%
2007	\$6,016,453,717	\$5,874,686,707	(\$141,767,010)	-2.41%	(\$855,797,821)	\$5,160,655,896	\$5,874,686,707	\$714,030,811	12.15%
2008	\$6,084,621,247	\$5,839,073,540	(\$245,547,707)	-4.21%	\$368,264,441	\$6,452,885,688	\$5,839,073,540	(\$613,812,148)	-10.51%
2009	\$5,253,110,989	\$5,688,508,594	\$435,397,605	7.65%	(\$1,723,597,065)	\$3,529,513,924	\$5,688,508,594	\$2,158,994,670	37.95%
2010	\$4,576,587,132	\$4,323,584,596	(\$253,002,536)	-5.85%	(\$500,229,888)	\$4,076,357,244	\$4,323,584,596	\$247,227,352	5.72%
2011	\$4,136,187,692	\$4,079,099,228	(\$57,088,464)	-1.40%	(\$387,658,446)	\$3,748,529,246	\$4,079,099,228	\$330,569,982	8.10%
2012	\$3,571,615,003	\$3,666,288,610	\$94,673,607	2.58%	(\$669,142,129)	\$2,902,472,874	\$3,666,288,610	\$763,815,736	20.83%
2013	\$3,236,315,354	\$3,093,026,968	(\$143,288,386)	-4.63%	\$17,542,395	\$3,253,857,749	\$3,093,026,968	(\$160,830,781)	-5.20%
2014	\$3,504,345,523	\$3,248,028,140	(\$256,317,383)	-7.89%	\$116,639,265	\$3,620,984,788	\$3,248,028,140	(\$372,956,648)	-11.48%

Note: This corrected table answers both Interrogatories

Average Annual Price and Price Volatility at the Henry Hub 1997-2015

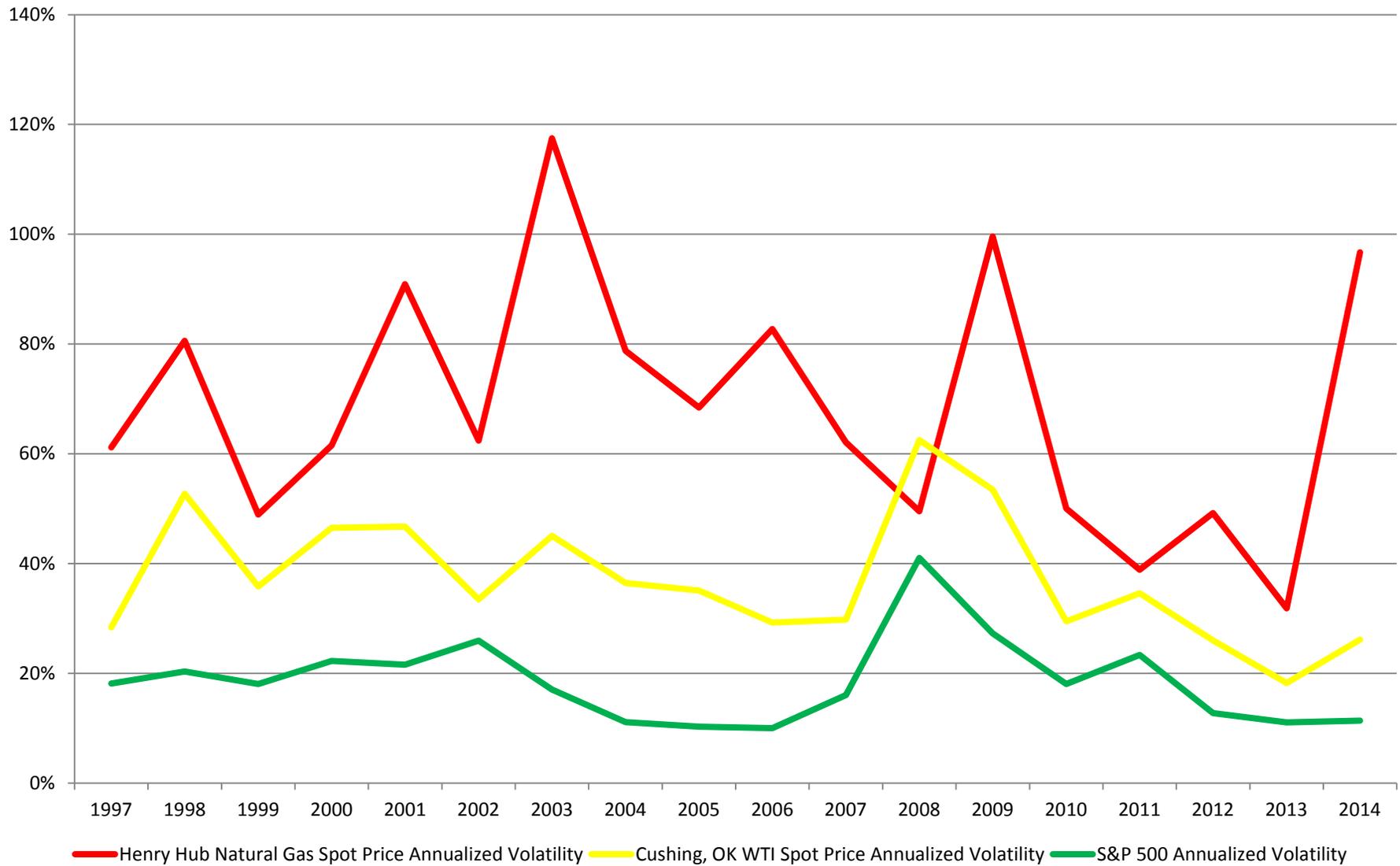


Case	Description	Volatility	2 STDEV (95%)	1 STDEV (68%)	Expected Market Price (\$/MMBtu)	1 STDEV (68%)	2 STDEV (95%)
1	Minimum Volatility (1997 through 2014)	32%	\$2.37	\$2.55	\$2.75	\$2.96	\$3.19
2	Maximum Volatility (1997 through 2014)	117%	\$1.61	\$2.09	\$2.75	\$3.63	\$4.77
3	Average Volatility (1997 through 2014)	68%	\$2.01	\$2.34	\$2.75	\$3.23	\$3.78
4	Current Volatility (2015)	49%	\$2.20	\$2.45	\$2.75	\$3.08	\$3.44
5	Recent Average Volatility (2012 through 2014)	59%	\$2.09	\$2.39	\$2.75	\$3.16	\$3.62

Unhedged Volume (BCF) 600

Case	Description	Volatility	2 STDEV (95%)	1 STDEV (68%)	Expected Market Price (\$/MMBtu)	1 STDEV (68%)	2 STDEV (95%)
1	Minimum Volatility (1997 through 2014)	32%	(\$224,959,603)	(\$118,470,991)	\$0	\$128,140,101	\$262,580,345
2	Maximum Volatility (1997 through 2014)	117%	(\$683,929,967)	(\$394,838,363)	\$0	\$527,442,967	\$1,210,711,521
3	Average Volatility (1997 through 2014)	68%	(\$443,900,722)	(\$243,469,243)	\$0	\$288,149,460	\$618,782,764
4	Current Volatility (2015)	49%	(\$329,702,990)	(\$176,932,498)	\$0	\$199,403,159	\$417,323,341
5	Recent Average Volatility (2012 through 2014)	59%	(\$392,773,950)	(\$213,295,864)	\$0	\$246,826,253	\$523,766,171

Annualized Volatility Comparison (1997-2014)



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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION
FLORIDA POWER & LIGHT COMPANY
REBUTTAL TESTIMONY OF JOHN J. REED
DOCKET NO. 150001
OCTOBER 9, 2015

Section 1: Introduction

Q. Please state your name and business address.

A. My name is John J. Reed. My business address is 293 Boston Post Road West, Marlborough, Massachusetts 01752.

Q. Have you previously filed direct testimony in this proceeding?

A. No, I have not.

Q. Please state the purpose of your rebuttal testimony.

A. I have been asked by Florida Power & Light Company (“FPL” or the “Company”) to respond to the testimony of Office of Public Counsel (“OPC”) witness William Jacobs, Jr., and specifically witness Jacobs’s recommendation that the Florida Public Service Commission (the “Commission”) require FPL to refund approximately \$8 million of replacement power costs related to an extended outage at the St. Lucie Nuclear Power Plant (“PSL” or the “Plant”). In particular, I will address the appropriate standard to be applied to the issue of the recoverability of those costs, and how FPL’s actions compare against that standard. I will discuss witness Jacobs’s suggestion that FPL’s actions were inconsistent with “good utility practice.” Finally, I will address the implications

1 of witness Jacobs’s disallowance recommendation, which would have a damaging
2 effect on the future costs of maintaining Florida’s nuclear generating fleet.

3 **Q. Please provide your qualifications to address these issues.**

4 A. I have more than 38 years of experience in the energy industry, having served as
5 an executive in energy consulting firms, including the position of Co-Chief
6 Executive Officer of the largest publicly-traded management consulting firm in
7 the United States and as Chief Economist for the largest gas utility in the United
8 States. I have provided expert testimony on a wide variety of economic and
9 financial issues related to the energy and utility industry on numerous occasions
10 before administrative agencies, utility commissions, courts, arbitration panels and
11 elected bodies across North America. I also have provided testimony on behalf
12 of FPL in its Nuclear Cost Recovery Clause (“NCRC”) proceedings for the last
13 seven years. My testimony in those proceedings has focused on the prudence of
14 the Company’s management of nuclear projects at PSL and Turkey Point. A
15 summary of my educational background can be found on Exhibit JJR-1.

16 **Q. Are you sponsoring any exhibits in this case?**

17 A. Yes. I am sponsoring Exhibits JJR-1 and JJR-2, which are attached to my
18 rebuttal testimony.

19 Exhibit JJR-1 Résumé of John J. Reed

20 Exhibit JJR-2 Expert Testimony of John J. Reed

21 **Q. Please summarize your conclusions regarding the direct testimony of**
22 **OPC witness Jacobs.**

23 A. The appropriate standard to apply to the issue of cost recovery in this case is the
24 prudence standard, which the Commission has applied in several other cases.

1 This standard considers whether the costs at issue were the product of an action
2 by the utility which was outside a range of reasonable behavior. Based on my
3 review of FPL's conduct in this case, and the rebuttal testimony of FPL witness
4 Terry Jones, I have concluded that FPL's conduct was not outside the range of
5 reasonable behavior under the circumstances in which its decisions were made,
6 and the recovery of replacement power costs should not be denied by the
7 Commission.

8 By penalizing FPL for factors outside of its control, witness Jacobs's
9 recommendation would set a dangerous precedent for the Florida nuclear
10 industry. Denying FPL recovery of these replacement power costs would
11 effectively transform the prudence standard into one of strict liability for the
12 utility for any action of its contractors that results in higher costs for customers.
13 Such a new standard could be expected to cause FPL to prefer to either self-
14 perform all of its nuclear maintenance activities, or seek to transfer its risk of
15 liability for consequential events to its vendors through much stricter contract
16 terms, which would result in much higher vendor rates and a significant
17 reduction in the number of vendors willing and able to bid on nuclear work.
18 Either approach would likely lead to a substantial increase in the cost of
19 maintaining the Company's nuclear fleet.

20 **Q. How is the remainder of your testimony organized?**

21 A. In Section 2 of my testimony, I review the appropriate standard against which
22 the Company's actions and decisions pertaining to the outage should be
23 measured and provide the relevant history surrounding the 2014 outage at PSL.
24 In Section 3, I discuss FPL's engagement of an industry-leading vendor to

1 complete complex engineering and maintenance activities, and how FPL's
2 decisions and actions compare to the range of reasonable conduct. I then
3 discuss the policy implications of the disallowance of replacement power costs
4 incurred as a result of this event in Section 4. I provide my conclusions in
5 Section 5.

6 **Section 2: Standard of Review and April 2014 Outage**

7 **Q. What is the appropriate standard of review of FPL's actions for**
8 **maintenance of its nuclear stations?**

9 A. The prudence standard, which is applied to economic regulation and cost
10 recovery, considers a range of reasonable behaviors and circumstances and is the
11 appropriate standard to apply in this case. The "range of reasonable behavior"
12 concept that is a key component of the prudence standard recognizes that
13 nuclear projects such as outage-related, maintenance work is not risk free. The
14 prudence standard does not apply a standard of perfection to utility decision-
15 making or performance. Additionally, the prudence standard is not results-based
16 and it prohibits the use of hindsight to evaluate the reasonableness of actions
17 taken at the time.

18 **Q. Has the Commission adopted a definitive standard of prudence?**

19 A. Yes, the Commission has adopted the following standard of prudence (Order
20 No. PSC-09-0783-FOF-EI):

21 The applicable standard for determining prudence is
22 consideration of what a reasonable utility manager would
23 have done in light of conditions and circumstances which
24 were known or reasonably should have been known at the
25 time decisions were made.

1 This definition has been used by the Commission on many occasions over the
2 last decade.

3 It is important to note that this definition of the prudence standard
4 includes consideration of “conditions and circumstances” at the time actions
5 were taken. An important condition in this case is the nature of the contract
6 between FPL and Westinghouse, and the level of responsibility FPL reasonably
7 delegated to the vendor and relied upon in overseeing work at the station.

8 **Q. What is an appropriate application of the prudence standard as it relates to**
9 **this event?**

10 A. An appropriate application of the prudence standard (1) identifies what was
11 reasonably known or knowable by FPL at the time of its decisions or actions
12 given the specific circumstances faced by the Company; (2) does not use
13 hindsight to identify what the prudent course of action would have been based
14 on the end result of management’s decisions; and (3) considers a range of
15 reasonable behavior regarding the decisions and actions that were under that
16 Company’s control and responsibility.

17 **Q. Are the recommendations made by witness Jacobs consistent with this**
18 **prudence standard?**

19 A. No. Witness Jacobs failed to apply the Commission’s established standard of
20 prudence. On page 4, line 12, witness Jacobs explains that he was asked to
21 determine whether the outage extension was “preventable.” However, with the
22 benefit of hindsight, it is likely that many outage extensions at electric power
23 plants could be determined to be “preventable.” The pertinent question is not

1 whether an outage extension was preventable, but whether it was the result of an
2 imprudent action or decision by FPL.

3 **Q. Has the Commission specifically evaluated the prudence of FPL’s nuclear**
4 **vendor management in the past?**

5 A. Yes. The Commission has considered issues of prudence surrounding FPL’s
6 nuclear contracting practices and procedures in annual cost recovery proceedings
7 related to Extended Power Upgrades (“EPU”) that were completed on FPL’s
8 nuclear stations between 2010 and 2013. In each proceeding in which these
9 concepts have been addressed, the Commission has found that the Company’s
10 actions surrounding vendor oversight and management were prudent. While
11 each event must be reviewed on its own, it is important to recognize that the
12 policies, practices, and procedures that were in place for this event are nearly
13 identical to what has been reviewed by the Commission in the past.

14 **Q. Please provide an overview of the event for which OPC is recommending a**
15 **cost disallowance.**

16 A. Shortly after beginning the restart sequence following a refueling and
17 maintenance outage in April 2014, system alarms indicated the presence of a
18 loose part inside a PSL steam generator. An evaluation of the alarm signal and
19 associated equipment confirmed that a loose part was inside the primary side of
20 the Steam Generator B channel head. FPL depressurized the reactor and
21 conducted damage inspections, which revealed a single loose part in the steam
22 generator channel head. The object has been identified as the remains of a
23 “Hurricane Ball” nozzle that is used for hydro-lancing in nuclear plants.

1 FPL's Root Cause Team was mobilized to determine the cause of
2 the outage and develop appropriate corrective actions to prevent similar
3 events from happening again. The revised root cause evaluation ("RCE")
4 that is referenced by witness Jacobs determined that the foreign material
5 was most likely introduced into the reactor coolant system during upper
6 guide structure ("UGS") thimble replacement work in 2011.

7 During the 2011 thimble replacement project, a nozzle similar to
8 the Hurricane Ball separated from its spray wand and descended to the
9 lower cavity floor. That instance, in which the nozzle was located and
10 retrieved, supports the conclusion that this same work was likely the source
11 of the foreign material that caused the April 2014 outage. The rebuttal
12 testimony of FPL witness Terry Jones addresses the event in more detail.

13 **Q. What are the relevant decisions and actions by FPL that should be**
14 **evaluated by the Commission in this matter?**

15 A. The decisions and actions that are relevant to this matter are those decisions and
16 actions that were within the Company's control. Those decisions and actions
17 included: (1) FPL's selection of Westinghouse to perform the thimble tube
18 replacement and maintenance work at the Plant; (2) the decision to have the
19 work performed under a contract that limited the contractor's liability for
20 indirect and consequential damages; (3) FPL's reliance on Westinghouse's
21 procedures, training, and oversight for the work, including Westinghouse's tool
22 accountability and control, and FME procedures; and (4) FPL's oversight and
23 management of Westinghouse and the contract between the parties.

1 **Q. Witness Jacobs suggests that FPL bears responsibility for costs related to**
2 **the 2014 outage. Do you agree?**

3 A. No, I do not. The control and oversight failures that witness Jacobs alleges were
4 the responsibility of FPL are not failures to adhere to industry standards as
5 discussed by Mr. Jones, and reflect the use of hindsight to the actions of FPL's
6 contractor, whose knowledge and expertise were appropriately relied upon by the
7 Company. FPL, as the owner and licensee at PSL, is ultimately responsible for
8 the safe operations of the facilities, and must apply effective oversight of
9 contractors that perform work at the Plant on behalf of the Company. However,
10 witness Jacobs's recommendation improperly expands that responsibility and
11 extends it to strict liability for the Company's contractor.

12 FPL has used well-documented procedures that are standard throughout
13 the nuclear industry to select and engage contractors with significant experience
14 and engineering expertise for nuclear maintenance activities. These procedures
15 include rigorous oversight of contractor quality programs and project
16 management practices, and are designed to provide the greatest value to FPL
17 customers.

18 For these reasons, I conclude that the Commission should reject witness
19 Jacobs's recommendations and allow FPL to recover its reasonable outage-
20 related costs.

21 **Q. What was the source that witness Jacobs primarily relied on in developing**
22 **his recommendations?**

23 A. It appears that the conclusions in witness Jacobs's testimony are based primarily
24 on his reading of a May 2014 RCE that was prepared in response to the outage.

1 FPL conducted extensive additional investigations and analysis subsequent to the
2 May RCE, and reached far more accurate and detailed conclusions in July 2015,
3 which witness Jacobs almost entirely dismisses.

4 **Q. What is the key conclusion of the July 2015 RCE?**

5 A. The more comprehensive July 2015 RCE found that the root cause of the outage
6 event was the thimble tube maintenance work that was managed and overseen by
7 Westinghouse during the 2011 SL2-19 outage. This determination was made on
8 the basis of interviews with workers from both FPL and its contractors and a
9 comprehensive review of documentation from SL2-19 and later outages.
10 Witness Jacobs seems to accept that the foreign material likely entered the
11 reactor coolant system in 2011, not 2014, as concluded in the July 2015 RCE.

12

13 **Section 3: Engagement of an Industry-Leading Vendor and Oversight by FPL**

14 **Q. Did FPL follow any existing procedures to engage Westinghouse to**
15 **complete the thimble tube maintenance work?**

16 A. Yes it did. FPL followed Procedure NP-1100r16, which applies to all nuclear
17 procurement activity. This procedure is consistent with long-established,
18 nuclear-industry standard contracting procedures. As described by witness
19 Jones, Westinghouse was a highly qualified and appropriate vendor for the
20 thimble maintenance and replacement work.

21 FPL's Supply Chain organization selected Westinghouse in large part
22 because, as the original equipment manufacturer ("OEM") of the PSL steam
23 generators, Westinghouse had detailed engineering knowledge of the equipment.
24 In addition, FPL found that Westinghouse had an extensive track record of

1 success completing similar work at other stations around the country. There is
2 no evidence to suggest that FPL's selection of Westinghouse was outside the
3 range of acceptable behavior.

4 **Q. Did FPL's contract appropriately assign responsibilities to the vendor?**

5 A. Yes. The detailed contract assigned Westinghouse responsibility for control and
6 oversight of the thimble replacement, and for monitoring FME controls while
7 work was underway. FPL reasonably relied upon Westinghouse to follow
8 procedures and FME controls that had been successfully applied in a number of
9 cases before.

10 Based on Mr. Jones' analysis, witness Jacobs's assertion that FPL should
11 have detected the presence of foreign matter at the end of the thimble tube work
12 before commencing the restart sequence suggests a level of responsibility that is
13 clearly outside a reasonable application of the prudence standard.

14 **Q. Did FPL act reasonably in agreeing to a contract for the steam generator
15 work that limited Westinghouse's liability to a capped amount of direct
16 damages?**

17 A. Yes, those terms are absolutely within the range of reasonable conduct for
18 outage services contracts in the nuclear industry. This issue has arisen in FPL's
19 nuclear cost recovery cases before the Commission, including in Docket No.
20 120009-EI, in which I testified on the prudence and cost recovery for FPL's
21 EPU expenditures. As part of the EPU, FPL contracted with Siemens to
22 perform work on the turbine generator at PSL Unit 2. At the conclusion of that
23 work, a tool was left in the turbine generator, which resulted in damage and
24 extended an outage. As in this case, Siemens' contract contained a limit of

1 liability provision that applied to replacement power costs. The inclusion of this
2 sort of contract provision, as I discuss later in this testimony, is the industry
3 norm for work of this nature.

4 **Q. Was it reasonable for FPL to rely on Westinghouse's policies and**
5 **programs for tool accountability and FME procedures?**

6 A. Based on my review of the RCEs and the rebuttal testimony of witness Jones, I
7 have concluded that these actions were reasonable. My review of the testimony
8 of witness Jacobs does not change my opinion. Witness Jacobs has not offered
9 the kind of evidence I would expect if he intended to support an opinion that
10 FPL's actions were imprudent. He has not defined a range of reasonable
11 behavior, and he has not shown that FPL's actions were outside of that range.
12 He has also not provided any support for assigning strict liability to FPL for its
13 contractor's action, either as a matter of regulatory policy or industry practice. It
14 is clear that a mistake was made in leaving the nozzle within the UGS, and not
15 recognizing that this had happened. But, the existence of a mistake does not
16 equate to imprudence on FPL's part. The prudence standard, correctly applied,
17 recognizes that decisions and actions are to be evaluated, not results. Those
18 decisions and actions are to be judged against a range of behavior based on what
19 reasonable people would have done under the circumstances. I have concluded
20 that the facts here do not support a finding that FPL's conduct in this matter was
21 outside of such a reasonable range of conduct.

1 **Q. Witness Jacobs also criticizes the inspections FPL performed during the**
2 **2011, 2012 and 2014 outages. Should the same standard apply to the**
3 **Commission's evaluation of FPL's decisions associated with those**
4 **inspections?**

5 A. Yes. The Commission should evaluate whether the type of inspections
6 performed by FPL fall within the range of reasonable actions under the
7 Company's control and responsibility, based on what FPL reasonably knew or
8 should have known at the time.

9 **Q. Was FPL's decision to perform visual inspections reasonable?**

10 A. Yes. Based on my review FPL's procedures and records, and after reviewing the
11 rebuttal testimony of witness Jones, I have concluded that visual inspections
12 were within the range of industry practices of FME inspection of reactor upper
13 guide structures and that FPL had no reason to believe at the time that more
14 intrusive inspections were warranted.

15 **Section 4: Implications of a Disallowance**

16 **Q. What does witness Jacobs's recommended disallowance imply in terms of**
17 **responsibility for the risk associated with nuclear maintenance projects?**

18 A. By suggesting that FPL should bear the cost of replacement power, witness
19 Jacobs's recommendation suggests that FPL bears the sole liability for the
20 actions not only of itself, but also of its contractors. The assignment of this
21 level of liability to the Company, without showing that FPL was imprudent,
22 would represent a significant risk shift for which FPL is not compensated and
23 that FPL would necessarily seek to eliminate in the future through contracting
24 strategies that transfer risk to vendors.

1 **Q. What would be the effect of transforming the prudence standard into a**
2 **policy of strict liability for the actions of other parties involved in Plant**
3 **maintenance activities?**

4 A. The effect of such a policy would be substantial. In order to avoid bearing any
5 risk associated with the work of contractors, FPL would be faced with two
6 options: either self-perform all work in the future or, more likely, transfer risk for
7 direct and consequential damages to vendors through far more aggressive
8 contract provisions in future procurements.

9 Both of these options would almost certainly result in significant added
10 costs to customers. For projects where self-performance is even a technical
11 feasibility (i.e., it would not require OEM knowledge), FPL would not receive the
12 benefit that contractors bring in terms of lessons learned and skills acquired at
13 other plants. In the case of the steam generator thimble replacement,
14 Westinghouse had completed this work numerous times at other U.S. nuclear
15 stations before being engaged to do this work at PSL. To conduct this work
16 internally, FPL would be required to go to great expense to develop or acquire
17 the capability to perform an extensive array of nuclear construction and
18 maintenance activities. The Company does not currently possess all of these
19 capabilities today. Rather, it has appropriately chosen to engage the competitive
20 market to provide highly technical services rather than bear the costs of
21 developing and maintaining in-house expertise that is employed only periodically.

22 Transferring risk through contract mechanisms, even if it is possible,
23 would entail far greater costs. The pool of vendors capable of completing safety-
24 related engineering and construction— and willing to accept full liability for

1 direct and consequential damages, including replacement power costs associated
2 with all work activities— would be extremely limited, if any party would be
3 willing to take this on at all. Contractors would require that a large risk premium
4 be added to project costs in order to agree to take on this additional risk.

5 **Q. Although you maintain that FPL should not be penalized under the**
6 **prudence standard for the cost of replacement power, will the Company**
7 **still face economic consequences associated with this outage?**

8 A. Yes. As I discuss above, the appropriate standard of review when considering
9 *cost recovery* issues is the prudence standard, which is not a results-based standard.
10 The prudence standard is based on “inputs” in that it addresses the decisions and
11 actions of Company management, not on the “outputs,” which can only be
12 known after an initiative has been completed.

13 Apart from the issue of cost recovery, the Commission has had in place
14 since 1980 (see Order No. 9558 in Docket No. 800400-CI) a Generation
15 Performance Incentive Factor (“GPIF”), which is intended to “provide an
16 incentive for the efficient operation of base load generating units.” This
17 regulatory mechanism is intended to be results-oriented, is not cost-based, and
18 will reflect the economic effects of extended outages.

19 **Q. What conclusions have you reached from reviewing the GPIF results for**
20 **PSL?**

21 A. The GPIF data are instructive in two important respects concerning PSL.

22 First, the GPIF data show that PSL has been performing well overall.
23 For each of the five years from 2010 through 2014, PSL, overall, met or
24 exceeded its targets defined under the GPIF mechanism for both availability (as

1 measured by equivalent availability factor) and efficiency (as measured by heat
2 rate). This strong performance saved FPL's customers tens of millions of dollars
3 in fuel costs over that time period.

4 Second, FPL has already experienced a results-oriented reduction in its
5 compensation under the GPIF as a result of the 2014 PSL-2 outage extension.
6 Deviations from targets in duration and magnitude of outages directly affect the
7 Company's GPIF rewards and penalties. The 12 day extension to the 2014 PSL-
8 2 outage that was caused by the FME event discussed above resulted in a
9 decrease in Plant availability, which decreased the 2014 GPIF reward for the
10 Plant by over \$232,000.

11 Thus, the GPIF is already rewarding and penalizing operational results.
12 There is no need or justification for disallowing recovery of replacement power
13 costs associated with a particular outage, as witness Jacobs recommends here,
14 unless FPL is shown to have acted imprudently with respect to that outage. As I
15 explained previously, the evidence shows the contrary: that FPL acted prudently
16 with respect to the 2014 PSL-2 extended outage.

17 **Section 5: Conclusions**

18 **Q. Please summarize your conclusions regarding the recommendations**
19 **included in witness Jacobs's testimony.**

20 A. Witness Jacobs's conclusions appear to be based on an incomplete reading of the
21 record in this case. He does not acknowledge the reasonable and prudent
22 actions FPL took to select and contract with a qualified vendor for the thimble
23 replacement program. Acceptance of witness Jacobs's recommendation in this
24 case would significantly raise the costs FPL would face in engaging the market

1 for nuclear maintenance activities. These substantially elevated costs would
2 inevitably raise costs to FPL customers for the remainder of the service life of
3 the Company's nuclear fleet.

4 **Q. Should the Commission deny the recovery of replacement power costs**
5 **associated with the April 2014 outage?**

6 A. No, it should not.

7 **Q. Does this conclude your testimony?**

8 A. Yes, it does.

9

John J. Reed
Chairman and Chief Executive Officer

John J. Reed is a financial and economic consultant with more than 35 years of experience in the energy industry. Mr. Reed has also been the CEO of an NASD member securities firm, and Co-CEO of the nation's largest publicly traded management consulting firm (NYSE: NCI). He has provided advisory services in the areas of mergers and acquisitions, asset divestitures and purchases, strategic planning, project finance, corporate valuation, energy market analysis, rate and regulatory matters and energy contract negotiations to clients across North and Central America. Mr. Reed's comprehensive experience includes the development and implementation of nuclear, fossil, and hydroelectric generation divestiture programs with an aggregate valuation in excess of \$20 billion. Mr. Reed has also provided expert testimony on financial and economic matters on more than 150 occasions before the FERC, Canadian regulatory agencies, state utility regulatory agencies, various state and federal courts, and before arbitration panels in the United States and Canada. After graduation from the Wharton School of the University of Pennsylvania, Mr. Reed joined Southern California Gas Company, where he worked in the regulatory and financial groups, leaving the firm as Chief Economist in 1981. He served as executive and consultant with Stone & Webster Management Consulting and R.J. Rudden Associates prior to forming REED Consulting Group (RCG) in 1988. RCG was acquired by Navigant Consulting in 1997, where Mr. Reed served as an executive until leaving Navigant to join Concentric as Chairman and Chief Executive Officer.

REPRESENTATIVE PROJECT EXPERIENCE

Executive Management

As an executive-level consultant, worked with CEOs, CFOs, other senior officers, and Boards of Directors of many of North America's top electric and gas utilities, as well as with senior political leaders of the U.S. and Canada on numerous engagements over the past 25 years. Directed merger, acquisition, divestiture, and project development engagements for utilities, pipelines and electric generation companies, repositioned several electric and gas utilities as pure distributors through a series of regulatory, financial, and legislative initiatives, and helped to develop and execute several "roll-up" or market aggregation strategies for companies seeking to achieve substantial scale in energy distribution, generation, transmission, and marketing.

Financial and Economic Advisory Services

Retained by many of the nation's leading energy companies and financial institutions for services relating to the purchase, sale or development of new enterprises. These projects included major new gas pipeline projects, gas storage projects, several non-utility generation projects, the purchase and sale of project development and gas marketing firms, and utility acquisitions. Specific services provided include the development of corporate expansion plans, review of acquisition candidates, establishment of divestiture standards, due diligence on acquisitions or financing, market entry or expansion studies, competitive assessments, project financing studies, and negotiations relating to these transactions.

Litigation Support and Expert Testimony

Provided expert testimony on more than 200 occasions in administrative and civil proceedings on a wide range of energy and economic issues. Clients in these matters have included gas distribution utilities, gas pipelines, gas producers, oil producers, electric utilities, large energy consumers, governmental and regulatory agencies, trade associations, independent energy project developers, engineering firms, and gas and power marketers. Testimony has focused on issues ranging from broad regulatory and economic policy to virtually

all elements of the utility ratemaking process. Also frequently testified regarding energy contract interpretation, accepted energy industry practices, horizontal and vertical market power, quantification of damages, and management prudence. Has been active in regulatory contract and litigation matters on virtually all interstate pipeline systems serving the U.S. Northeast, Mid-Atlantic, Midwest, and Pacific regions.

Also served on FERC Commissioner Terzic's Task Force on Competition, which conducted an industry-wide investigation into the levels of and means of encouraging competition in U.S. natural gas markets and served on a "Blue Ribbon" panel established by the Province of New Brunswick regarding the future of natural gas distribution service in that province.

Resource Procurement, Contracting and Analysis

On behalf of gas distributors, gas pipelines, gas producers, electric utilities, and independent energy project developers, personally managed or participated in the negotiation, drafting, and regulatory support of hundreds of energy contracts, including the largest gas contracts in North America, electric contracts representing billions of dollars, pipeline and storage contracts, and facility leases.

These efforts have resulted in bringing large new energy projects to market across North America, the creation of hundreds of millions of dollars in savings through contract renegotiation, and the regulatory approval of a number of highly contested energy contracts.

Strategic Planning and Utility Restructuring

Acted as a leading participant in the restructuring of the natural gas and electric utility industries over the past fifteen years, as an adviser to local distribution companies, pipelines, electric utilities, and independent energy project developers. In the recent past, provided services to most of the top 50 utilities and energy marketers across North America. Managed projects that frequently included the redevelopment of strategic plans, corporate reorganizations, the development of multi-year regulatory and legislative agendas, merger, acquisition and divestiture strategies, and the development of market entry strategies. Developed and supported merchant function exit strategies, marketing affiliate strategies, and detailed plans for the functional business units of many of North America's leading utilities.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2002 – Present)

Chairman and Chief Executive Officer

CE Capital Advisors (2004 – Present)

Chairman, President, and Chief Executive Officer

Navigant Consulting, Inc. (1997 – 2002)

President, Navigant Energy Capital (2000 – 2002)

Executive Director (2000 – 2002)

Co-Chief Executive Officer, Vice Chairman (1999 – 2000)

Executive Managing Director (1998 – 1999)

President, REED Consulting Group, Inc. (1997 – 1998)

REED Consulting Group (1988 – 1997)

Chairman, President and Chief Executive Officer

R.J. Rudden Associates, Inc. (1983 – 1988)

Vice President

Stone & Webster Management Consultants, Inc. (1981 – 1983)

Senior Consultant

Consultant

Southern California Gas Company (1976 – 1981)

Corporate Economist

Financial Analyst

Treasury Analyst

EDUCATION AND CERTIFICATION

B.S., Economics and Finance, Wharton School, University of Pennsylvania, 1976

Licensed Securities Professional: NASD Series 7, 63, 24, 79 and 99 Licenses

BOARDS OF DIRECTORS (PAST AND PRESENT)

Concentric Energy Advisors, Inc.

Navigant Consulting, Inc.

Navigant Energy Capital

Nukem, Inc.

New England Gas Association

R. J. Rudden Associates

REED Consulting Group

AFFILIATIONS

American Gas Association

Energy Bar Association

Guild of Gas Managers

International Association of Energy Economists

National Association of Business Economists

New England Gas Association

Society of Gas Lighters

ARTICLES AND PUBLICATIONS

“Maximizing U.S. federal loan guarantees for new nuclear energy,” *Bulletin of the Atomic Scientists* (with John C. Slocum), July 29, 2009

“Smart Decoupling – Dealing with unfunded mandates in performance-based ratemaking,” *Public Utilities Fortnightly*, May 2012



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Alaska Public Utilities Commission				
Chugach Electric	12/86	Chugach Electric	Docket No. U-86-11	Cost Allocation
Chugach Electric	6/87	Enstar Natural Gas Company	Docket No. U-87-2	Tariff Design
Chugach Electric	12/87	Enstar Natural Gas Company	Docket No. U-87-42	Gas Transportation
Chugach Electric	11/87 2/88	Chugach Electric	Docket No. U-87-35	Cost of Capital
Alberta Utilities Commission				
Alberta Utilities (AltaLink, EPCOR, ATCO, ENMAX, FortisAlberta, Alta Gas)	1/13	Alberta Utilities	Application 1566373, Proceeding ID 20	Stranded Costs
Arizona Corporation Commission				
Tucson Electric Power	7/12	Tucson Electric Power	Docket No. E- 01933A-12-0291	Cost of Capital
UNS Energy and Fortis Inc.	1/14	UNS Energy, Fortis Inc.	Docket No. E- 04230A-00011 and Docket No. E- 01933A-14-0011	Merger
California Energy Commission				
Southern California Gas Co.	8/80	Southern California Gas Co.	Docket No. 80-BR-3	Gas Price Forecasting
California Public Utility Commission				
Southern California Gas Co.	3/80	Southern California Gas Co.	TY 1981 G.R.C.	Cost of Service, Inflation
Pacific Gas Transmission Co.	10/91 11/91	Pacific Gas & Electric Co.	App. 89-04-033	Rate Design
Pacific Gas Transmission Co.	7/92	Southern California Gas Co.	A. 92-04-031	Rate Design



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Colorado Public Utilities Commission				
AMAX Molybdenum	2/90	Commission Rulemaking	Docket No. 89R-702G	Gas Transportation
AMAX Molybdenum	11/90	Commission Rulemaking	Docket No. 90R-508G	Gas Transportation
Xcel Energy	8/04	Xcel Energy	Docket No. 031-134E	Cost of Debt
CT Dept. of Public Utilities Control				
Connecticut Natural Gas	12/88	Connecticut Natural Gas	Docket No. 88-08-15	Gas Purchasing Practices
United Illuminating	3/99	United Illuminating	Docket No. 99-03-04	Nuclear Plant Valuation
Southern Connecticut Gas	2/04	Southern Connecticut Gas	Docket No. 00-12-08	Gas Purchasing Practices
Southern Connecticut Gas	4/05	Southern Connecticut Gas	Docket No. 05-03-17	LNG/Trunkline
Southern Connecticut Gas	5/06	Southern Connecticut Gas	Docket No. 05-03-17PH01	LNG/Trunkline
Southern Connecticut Gas	8/08	Southern Connecticut Gas	Docket No. 06-05-04	Peaking Service Agreement
District Of Columbia PSC				
Potomac Electric Power Company	3/99 5/99 7/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts
Federal Energy Regulatory Commission				
Safe Harbor Water Power Corp.	8/82	Safe Harbor Water Power Corp.		Wholesale Electric Rate Increase
Western Gas Interstate Company	5/84	Western Gas Interstate Company	Docket No. RP84-77	Load Fcst. Working Capital



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Southern Union Gas	4/87 5/87	El Paso Natural Gas Company	Docket No. RP87-16-000	Take-or-Pay Costs
Connecticut Natural Gas	11/87	Penn-York Energy Corporation	Docket No. RP87-78-000	Cost Allocation/Rate Design
AMAX Magnesium	12/88 1/89	Questar Pipeline Company	Docket No. RP88-93-000	Cost Allocation/Rate Design
Western Gas Interstate Company	6/89	Western Gas Interstate Company	Docket No. RP89-179-000	Cost Allocation/Rate Design, Open-Access Transportation
Associated CD Customers	12/89	CNG Transmission	Docket No. RP88-211-000	Cost Allocation/Rate Design
Utah Industrial Group	9/90	Questar Pipeline Company	Docket No. RP88-93-000, Phase II	Cost Allocation/Rate Design
Iroquois Gas Trans. System	8/90	Iroquois Gas Transmission System	Docket No. CP89-634-000/001; CP89-815-000	Gas Markets, Rate Design, Cost of Capital, Capital Structure
Boston Edison Company	1/91	Boston Edison Company	Docket No. ER91-243-000	Electric Generation Markets
Cincinnati Gas and Electric Co., Union Light, Heat and Power Company, Lawrenceburg Gas Company	7/91	Texas Gas Transmission Corp.	Docket No. RP90-104-000, RP88-115-000, RP90-192-000	Cost Allocation/Rate Design Comparability of Service
Ocean State Power II	7/91	Ocean State Power II	ER89-563-000	Competitive Market Analysis, Self-dealing
Brooklyn Union/PSE&G	7/91	Texas Eastern	RP88-67, et al	Market Power, Comparability of Service
Northern Distributor Group	9/92 11/92	Northern Natural Gas Company	RP92-1-000, et al	Cost of Service



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Canadian Association of Petroleum Producers and Alberta Pet. Marketing Comm.	10/92 7/97	Lakehead Pipe Line Co. L.P.	IS92-27-000	Cost Allocation, Rate Design
Colonial Gas, Providence Gas	7/93 8/93	Algonquin Gas Transmission	RP93-14	Cost Allocation, Rate Design
Iroquois Gas Transmission	94	Iroquois Gas Transmission	RP94-72-000	Cost of Service and Rate Design
Transco Customer Group	1/94	Transcontinental Gas Pipeline Corporation	Docket No. RP92-137-000	Rate Design, Firm to Wellhead
Pacific Gas Transmission	2/94 3/95	Pacific Gas Transmission	Docket No. RP94-149-000	Rolled-In vs. Incremental Rates, Rate Design
Tennessee GSR Group	1/95 3/95 1/96	Tennessee Gas Pipeline Company	Docket Nos. RP93-151-000, RP94-39-000, RP94-197-000, RP94-309-000	GSR Costs
PG&E and SoCal Gas	8/96 9/96	El Paso Natural Gas Company	RP92-18-000	Stranded Costs
Iroquois Gas Transmission System, L.P.	97	Iroquois Gas Transmission System, L.P.	RP97-126-000	Cost of Service, Rate Design
BEC Energy - Commonwealth Energy System	2/99	Boston Edison Company/ Commonwealth Energy System	EC99-33-000	Market Power Analysis – Merger
Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc.	10/00	Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc.	Docket No. EC01-7-000	Market Power 203/205 Filing
Wyckoff Gas Storage	12/02	Wyckoff Gas Storage	CP03-33-000	Need for Storage Project



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Indicated Shippers/Producers	10/03	Northern Natural Gas	Docket No. RP98-39-029	Ad Valorem Tax Treatment
Maritimes & Northeast Pipeline	6/04	Maritimes & Northeast Pipeline	Docket No. RP04-360-000	Rolled-In Rates
ISO New England	8/04 2/05	ISO New England	Docket No. ER03-563-030	Cost of New Entry
Transwestern Pipeline Company, LLC	9/06	Transwestern Pipeline Company, LLC	Docket No. RP06-614-000	
Portland Natural Gas Transmission System	6/08	Portland Natural Gas Transmission System	Docket No. RP08-306-000	Market Assessment, Natural Gas Transportation, Rate Setting
Portland Natural Gas Transmission System	5/10 3/11 4/11	Portland Natural Gas Transmission System	Docket No. RP10-729-000	Business Risks, Extraordinary and Non-recurring Events Pertaining to Discretionary Revenues
Morris Energy	7/10	Morris Energy	Docket No. RP10-79-000	Affidavit re: Impact of Preferential Rate
Gulf South Pipeline	10/14	Gulf South Pipeline	Docket No. RP15-65-000	Business risk, Rate Design
BNP Paribas Energy Trading, GP South Jersey Resource Group, LLC	3/15	Transcontinental Gas Pipe Line Corporation	Docket No. RP06-569-008 and RP07-376-005	Regulatory Policy, Incremental Rates, Stacked Rate
Florida Public Service Commission				
Florida Power and Light Co.	10/07	Florida Power & Light Co.	Docket No. 070650-EI	Need for New Nuclear Plant



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Florida Power and Light Co.	5/08	Florida Power & Light Co.	Docket No. 080009-EI	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/09	Florida Power & Light Co.	Docket No. 080677-EI	Benchmarking in Support of ROE
Florida Power and Light Co.	3/09 5/09 8/09	Florida Power & Light Co.	Docket No. 090009-EI	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/10 5/10 8/10	Florida Power & Light Co.	Docket No. 100009-EI	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/11 7/11	Florida Power & Light Co.	Docket No. 110009-EI	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/12 7/12	Florida Power & Light Co.	Docket No. 120009-EI	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/12 8/12	Florida Power & Light Co.	Docket No. 120015-EI	Benchmarking in Support of ROE
Florida Power and Light Co.	3/13 7/13	Florida Power & Light Co.	Docket No. 130009	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/14	Florida Power & Light Co.	Docket No. 140009	New Nuclear Cost Recovery, Prudence
Florida Power and Light Co.	3/15 8/15	Florida Power & Light Co.	Docket No. 150009	New Nuclear Cost Recovery, Prudence
Florida Senate Committee on Communication, Energy and Utilities				
Florida Power and Light Co.	2/09	Florida Power & Light Co.		Securitization



SPONSOR	DATE	CASE/APPLICANT	DOCKET No.	SUBJECT
Hawai'i Public Utility Commission				
Hawaiian Electric Light Company, Inc. (HELCO)	6/00	Hawaiian Electric Light Company, Inc.	Docket No. 99-0207	Standby Charge
NextEra Energy, Inc. Hawaiian Electric Companies	4/15 5/15	Hawaiian Electric Company, Inc.; Hawaii Electric Light Company, Inc., Maui Electric Company, Ltd., NextEra Energy, Inc.	2015-0022	Merger Application
Illinois Commerce Commission				
Renewables Suppliers (Algonquin Power Co., EDP Renewables North America, Invenergy, NextEra Energy Resources)	3/14	Renewables Suppliers	Docket No. 13-0546	Application for Rehearing and Reconsideration, Long-term Purchase Power Agreements
WE Energies Corporation	8/14 12/14 2/15	WE Energies/Integrus	Docket No. 14-0496	Merger Application
Indiana Utility Regulatory Commission				
Northern Indiana Public Service Company	10/01	Northern Indiana Public Service Company	Cause No. 41746	Valuation of Electric Generating Facilities
Northern Indiana Public Service Company	01/08 03/08	Northern Indiana Public Service Company	Cause No. 43396	Asset Valuation
Northern Indiana Public Service Company	08/08	Northern Indiana Public Service Company	Cause No. 43526	Fair Market Value Assessment
Indianapolis Power & Light Company	12/14	Indianapolis Power & Light Company	Cause No. 44576	Asset Valuation



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Iowa Utilities Board				
Interstate Power and Light	7/05	Interstate Power and Light and FPL Energy Duane Arnold, LLC	Docket No. SPU-05-15	Sale of Nuclear Plant
Interstate Power and Light	5/07	City of Everly, Iowa	Docket No. SPU-06-5	Municipalization
Interstate Power and Light	5/07	City of Kalona, Iowa	Docket No. SPU-06-6	Municipalization
Interstate Power and Light	5/07	City of Wellman, Iowa	Docket No. SPU-06-10	Municipalization
Interstate Power and Light	5/07	City of Terril, Iowa	Docket No. SPU-06-8	Municipalization
Interstate Power and Light	5/07	City of Rolfe, Iowa	Docket No. SPU-06-7	Municipalization
Maine Public Utility Commission				
Northern Utilities	5/96	Granite State and PNGTS	Docket No. 95-480, 95-481	Transportation Service and PBR
Maryland Public Service Commission				
Eastalco Aluminum	3/82	Potomac Edison	Docket No. 7604	Cost Allocation
Potomac Electric Power Company	8/99	Potomac Electric Power Company	Docket No. 8796	Stranded Cost & Price Protection
Mass. Department of Public Utilities				
Haverhill Gas	5/82	Haverhill Gas	Docket No. DPU #1115	Cost of Capital



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
New England Energy Group	1/87	Commission Investigation		Gas Transportation Rates
Energy Consortium of Mass.	9/87	Commonwealth Gas Company	Docket No. DPU-87-122	Cost Allocation/Rate Design
Mass. Institute of Technology	12/88	Middleton Municipal Light	DPU #88-91	Cost Allocation/Rate Design
Energy Consortium of Mass.	3/89	Boston Gas	DPU #88-67	Rate Design
PG&E Bechtel Generating Co./ Constellation Holdings	10/91	Commission Investigation	DPU #91-131	Valuation of Environmental Externalities
Coalition of Non-Utility Generators		Cambridge Electric Light Co. & Commonwealth Electric Co.	DPU 91-234 EFSC 91-4	Integrated Resource Management
The Berkshire Gas Company Essex County Gas Company Fitchburg Gas and Elec. Light Co.	5/92	The Berkshire Gas Company Essex County Gas Company Fitchburg Gas & Elec. Light Co.	DPU #92-154	Gas Purchase Contract Approval
Boston Edison Company	7/92	Boston Edison	DPU #92-130	Least Cost Planning
Boston Edison Company	7/92	The Williams/Newcorp Generating Co.	DPU #92-146	RFP Evaluation
Boston Edison Company	7/92	West Lynn Cogeneration	DPU #92-142	RFP Evaluation
Boston Edison Company	7/92	L'Energia Corp.	DPU #92-167	RFP Evaluation
Boston Edison Company	7/92	DLS Energy, Inc.	DPU #92-153	RFP Evaluation
Boston Edison Company	7/92	CMS Generation Co.	DPU #92-166	RFP Evaluation
Boston Edison Company	7/92	Concord Energy	DPU #92-144	RFP Evaluation



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
The Berkshire Gas Company Colonial Gas Company Essex County Gas Company Fitchburg Gas and Electric Company	11/93	The Berkshire Gas Company Colonial Gas Company Essex County Gas Company Fitchburg Gas and Electric Co.	DPU #93-187	Gas Purchase Contract Approval
Bay State Gas Company	10/93	Bay State Gas Company	Docket No. 93-129	Integrated Resource Planning
Boston Edison Company	94	Boston Edison	DPU #94-49	Surplus Capacity
Hudson Light & Power Department	4/95	Hudson Light & Power Dept.	DPU #94-176	Stranded Costs
Essex County Gas Company	5/96	Essex County Gas Company	Docket No. 96-70	Unbundled Rates
Boston Edison Company	8/97	Boston Edison Company	D.P.U. No. 97-63	Holding Company Corporate Structure
Berkshire Gas Company	6/98	Berkshire Gas Mergeco Gas Co.	D.T.E. 98-87	Merger Approval
Eastern Edison Company	8/98	Montaup Electric Company	D.T.E. 98-83	Marketing for Divestiture of its Generation Business
Boston Edison Company	98	Boston Edison Company	D.T.E. 97-113	Fossil Generation Divestiture
Boston Edison Company	2/99	Boston Edison Company	D.T.E. 98-119	Nuclear Generation Divestiture
Eastern Edison Company	12/98	Montaup Electric Company	D.T.E. 99-9	Sale of Nuclear Plant
NStar	9/07 12/07	NStar, Bay State Gas, Fitchburg G&E, NE Gas, W. MA Electric	DPU 07-50	Decoupling, Risk
NStar	6/11	NStar, Northeast Utilities	DPU 10-170	Merger Approval



SPONSOR	DATE	CASE/APPLICANT	DOCKET No.	SUBJECT
Mass. Energy Facilities Siting Council				
Mass. Institute of Technology	1/89	M.M.W.E.C.	EFSC-88-1	Least-Cost Planning
Boston Edison Company	9/90	Boston Edison	EFSC-90-12	Electric Generation Markets
Silver City Energy Ltd. Partnership	11/91	Silver City Energy	D.P.U. 91-100	State Policies, Need for Facility
Michigan Public Service Commission				
Detroit Edison Company	9/98	Detroit Edison Company	Case No. U-11726	Market Value of Generation Assets
Consumers Energy Company	8/06 1/07	Consumers Energy Company	Case No. U-14992	Sale of Nuclear Plant
WE Energies	12/11	Wisconsin Electric Power Co	Case No. U-16830	Economic Benefits/Prudence
Consumer Energy Company	6/13	Consumers Energy Company	Case No. U-17429	Certificate of Need, Integrated Resource Plan
WE Energies	08/14 03/15	WE Energies/Integrus	Case No. U-17682	Merger Application
Minnesota Public Utilities Commission				
Xcel Energy/No. States Power	9/04	Xcel Energy/No. States Power	Docket No. G002/GR-04-1511	NRG Impacts
Interstate Power and Light	8/05	Interstate Power and Light and FPL Energy Duane Arnold, LLC	Docket No. E001/PA-05-1272	Sale of Nuclear Plant
Northern States Power Company d/b/a Xcel Energy	11/05	Northern States Power Company	Docket No. E002/GR-05-1428	NRG Impacts on Debt Costs



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Northern States Power Company d/b/a Xcel Energy	09/06 10/06 11/06	NSP v. Excelsior	Docket No. E6472/M-05-1993	PPA, Financial Impacts
Northern States Power Company d/b/a Xcel Energy	11/06	Northern States Power Company	Docket No. G002/GR-06-1429	Return on Equity
Northern States Power	11/08 05/09	Northern States Power Company	Docket No. E002/GR-08-1065	Return on Equity
Northern States Power	11/09 6/10	Northern States Power Company	Docket No. G002/GR-09-1153	Return on Equity
Northern States Power	11/10 5/11	Northern States Power Company	Docket No. E002/GR-10-971	Return on Equity
Missouri Public Service Commission				
Missouri Gas Energy	1/03 04/03	Missouri Gas Energy	Case No. GR-2001- 382	Gas Purchasing Practices, Prudence
Aquila Networks	2/04	Aquila-MPS, Aquila L&P	Case Nos. ER-2004- 0034 HR-2004-0024	Cost of Capital, Capital Structure
Aquila Networks	2/04	Aquila-MPS, Aquila L&P	Case No. GR-2004- 0072	Cost of Capital, Capital Structure
Missouri Gas Energy	11/05 2/06 7/06	Missouri Gas Energy	Case Nos. GR-2002- 348 GR-2003-0330	Capacity Planning
Missouri Gas Energy	11/10 1/11	KCP&L	Case No. ER-2010- 0355	Natural Gas DSM
Missouri Gas Energy	11/10, 1/11	KCP&L GMO	Case No. ER-2010- 0356	Natural Gas DSM
Laclede Gas Company	5/11	Laclede Gas Company	Case No. CG-2011- 0098	Affiliate Pricing Standards



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Union Electric Company d/b/a Ameren Missouri	2/12 8/12	Union Electric Company	Case No. ER-2012-0166	ROE, Earnings Attrition, Regulatory Lag
Union Electric Company d/b/a Ameren Missouri	08/14	Noranda Aluminum Inc.	Case No. EC-2014-0223	Ratemaking, Regulatory and Economic Policy
Union Electric Company d/b/a Ameren Missouri	1/15 2/15	Union Electric Company	Case No. ER-2014-0258	Revenue Requirements, Ratemaking Policies
Montana Public Service Commission				
Great Falls Gas Company	10/82	Great Falls Gas Company	Docket No. 82-4-25	Gas Rate Adjustment Clause
Nat. Energy Board of Canada				
Alberta-Northeast	2/87	Alberta Northeast Gas Export Project	Docket No. GH-1-87	Gas Export Markets
Alberta-Northeast	11/87	TransCanada Pipeline	Docket No. GH-2-87	Gas Export Markets
Alberta-Northeast	1/90	TransCanada Pipeline	Docket No. GH-5-89	Gas Export Markets
Indep. Petroleum Association of Canada	1/92	Interprovincial Pipe Line, Inc.	RH-2-91	Pipeline Valuation, Toll
The Canadian Association of Petroleum Producers	11/93	Transmountain Pipe Line	RH-1-93	Cost of Capital
Alliance Pipeline L.P.	6/97	Alliance Pipeline L.P.	GH-3-97	Market Study
Maritimes & Northeast Pipeline	97	Sable Offshore Energy Project	GH-6-96	Market Study
Maritimes & Northeast Pipeline	2/02	Maritimes & Northeast Pipeline	GH-3-2002	Natural Gas Demand Analysis
TransCanada Pipelines	8/04	TransCanada Pipelines	RH-3-2004	Toll Design



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Brunswick Pipeline	5/06	Brunswick Pipeline	GH-1-2006	Market Study
TransCanada Pipelines Ltd.	12/06 04/07	TransCanada Pipelines Ltd.: Gros Cacouna Receipt Point Application	RH-1-2007	Toll Design
Repsol Energy Canada Ltd	3/08	Repsol Energy Canada Ltd	GH-1-2008	Market Study
Maritimes & Northeast Pipeline	7/10	Maritimes & Northeast Pipeline	RH-4-2010	Regulatory Policy, Toll Development
TransCanada Pipelines Ltd	9/11 5/12	TransCanada Pipelines Ltd.	RH-3-2011	Business Services and Tolls Application
Trans Mountain Pipeline LLC	6/12 1/13	Trans Mountain Pipeline LLC	RH-1-2012	Toll Design
TransCanada Pipelines Ltd	8/13	TransCanada Pipelines Ltd	RE-001-2013	Toll Design
NOVA Gas Transmission Ltd	11/13	NOVA Gas Transmission Ltd	OF-Fac-Gas-N081- 2013-10 01	Toll Design
Trans Mountain Pipeline LLC	12/13	Trans Mountain Pipeline LLC	OF-Fac-Oil-T260- 2013-03 01	Economic and Financial Feasibility and Project Benefits
Energy East Pipeline Ltd.	10/14	Energy East Pipeline		Economic and Financial Feasibility and Project Benefits
New Brunswick Energy and Utilities Board				
Atlantic Wallboard/JD Irving Co	1/08	Enbridge Gas New Brunswick	MCTN #298600	Rate Setting for EGNB
Atlantic Wallboard/Flakeboard	09/09 6/10 7/10	Enbridge Gas New Brunswick	NBEUB 2009-017	Rate Setting for EGNB



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Atlantic Wallboard/Flakeboard	1/14	Enbridge Gas New Brunswick	NBEUB Matter 225	Rate Setting for EGNB
NH Public Utilities Commission				
Bus & Industry Association	6/89	P.S. Co. of New Hampshire	Docket No. DR89-091	Fuel Costs
Bus & Industry Association	5/90	Northeast Utilities	Docket No. DR89-244	Merger & Acquisition Issues
Eastern Utilities Associates	6/90	Eastern Utilities Associates	Docket No. DF89-085	Merger & Acquisition Issues
EnergyNorth Natural Gas	12/90	EnergyNorth Natural Gas	Docket No. DE90-166	Gas Purchasing Practices
EnergyNorth Natural Gas	7/90	EnergyNorth Natural Gas	Docket No. DR90-187	Special Contracts, Discounted Rates
Northern Utilities, Inc.	12/91	Commission Investigation	Docket No. DR91-172	Generic Discounted Rates
Public Service Co. of New Hampshire	7/14	Public Service Co. of NH	Docket No. DE 11-250	Prudence
Public Service Co. of New Hampshire	7/15	Public Service Co. of NH	Docket No. 14-238	Restructuring and Rate Stabilization
New Jersey Board of Public Utilities				
Hilton/Golden Nugget	12/83	Atlantic Electric	B.P.U. 832-154	Line Extension Policies
Golden Nugget	3/87	Atlantic Electric	B.P.U. No. 837-658	Line Extension Policies
New Jersey Natural Gas	2/89	New Jersey Natural Gas	B.P.U. GR89030335J	Cost Allocation/Rate Design
New Jersey Natural Gas	1/91	New Jersey Natural Gas	B.P.U. GR90080786J	Cost Allocation/Rate Design



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
New Jersey Natural Gas	8/91	New Jersey Natural Gas	B.P.U. GR91081393J	Rate Design, Weather Normalization Clause
New Jersey Natural Gas	4/93	New Jersey Natural Gas	B.P.U. GR93040114J	Cost Allocation/Rate Design
South Jersey Gas	4/94	South Jersey Gas	BRC Dock No. GR080334	Revised Levelized Gas Adjustment
New Jersey Utilities Association	9/96	Commission Investigation	BPU AX96070530	PBOP Cost Recovery
Morris Energy Group	11/09	Public Service Electric & Gas	BPU GR 09050422	Discriminatory Rates
New Jersey American Water Co.	4/10	New Jersey American Water Co.	BPU WR 1040260	Tariff Rates and Revisions
Electric Customer Group	1/11	Generic Stakeholder Proceeding	BPU GR10100761 and ER10100762	Natural Gas Ratemaking Standards and pricing
New Mexico Public Service Commission				
Gas Company of New Mexico	11/83	Public Service Co. of New Mexico	Docket No. 1835	Cost Allocation/Rate Design
Southwestern Public Service Co., New Mexico	12/12	SPS New Mexico	Case No. 12-00350-UT	Rate Case, Return on Equity
PNM Resources	12/13 10/14 12/14	Public Service Co. of New Mexico	Case No. 13-00390-UT	Nuclear Valuation/In Support of Stipulation
New York Public Service Commission				
Iroquois Gas Transmission	12/86	Iroquois Gas Transmission System	Case No. 70363	Gas Markets
Brooklyn Union Gas Company	8/95	Brooklyn Union Gas Company	Case No. 95-6-0761	Panel on Industry Directions



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Central Hudson, ConEdison and Niagara Mohawk	9/00	Central Hudson, ConEdison and Niagara Mohawk	Case No. 96-E-0909 Case No. 96-E-0897 Case No. 94-E-0098 Case No. 94-E-0099	Section 70, Approval of New Facilities
Central Hudson, New York State Electric & Gas, Rochester Gas & Electric	5/01	Joint Petition of NiMo, NYSEG, RG&E, Central Hudson, Constellation and Nine Mile Point	Case No. 01-E-0011	Section 70, Rebuttal Testimony
Rochester Gas & Electric	12/03	Rochester Gas & Electric	Case No. 03-E-1231	Sale of Nuclear Plant
Rochester Gas & Electric	01/04	Rochester Gas & Electric	Case No. 03-E-0765 Case No. 02-E-0198 Case No. 03-E-0766	Sale of Nuclear Plant; Ratemaking Treatment of Sale
Rochester Gas and Electric and NY State Electric & Gas Corp	2/10	Rochester Gas & Electric NY State Electric & Gas Corp	Case No. 09-E-0715 Case No. 09-E-0716 Case No. 09-E-0717 Case No. 09-E-0718	Depreciation policy
Nova Scotia Utility and Review Board				
Nova Scotia Power	9/12	Nova Scotia Power	Docket No. P-893	Audit Reply
Nova Scotia Power	8/14	Nova Scotia Power	Docket No. P-887	Audit Reply
Oklahoma Corporation Commission				
Oklahoma Natural Gas Company	6/98	Oklahoma Natural Gas Company	Case PUD No. 980000177	Storage Issues
Oklahoma Gas & Electric Company	9/05	Oklahoma Gas & Electric Company	Cause No. PUD 200500151	Prudence of McLain Acquisition
Oklahoma Gas & Electric Company	03/08	Oklahoma Gas & Electric Company	Cause No. PUD 200800086	Acquisition of Redbud Generating Facility



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Oklahoma Gas & Electric Company	08/14 01/15	Oklahoma Gas & Electric Company	Cause No. PUD 201400229	Integrated Resource Plan
Ontario Energy Board				
Market Hub Partners Canada, L.P.	5/06	Natural Gas Electric Interface Roundtable	File No. EB-2005-0551	Market-based Rates For Storage
Pennsylvania Public Utility Commission				
ATOC	4/95	Equitrans	Docket No. R-00943272	Rate Design, Unbundling
ATOC	3/96 4/96	Equitrans	Docket No. P-00940886	Rate Design, Unbundling
Rhode Island Public Utilities Commission				
Newport Electric	7/81	Newport Electric	Docket No. 1599	Rate Attrition
South County Gas	9/82	South County Gas	Docket No. 1671	Cost of Capital
New England Energy Group	7/86	Providence Gas Company	Docket No. 1844	Cost Allocation/Rate Design
Providence Gas	8/88	Providence Gas Company	Docket No. 1914	Load Forecast, Least-Cost Planning
Providence Gas Company and The Valley Gas Company	1/01 3/02	Providence Gas Company and The Valley Gas Company	Docket No. 1673 and 1736	Gas Cost Mitigation Strategy
The New England Gas Company	3/03	New England Gas Company	Docket No. 3459	Cost of Capital
Texas Public Utility Commission				
Southwestern Electric	5/83	Southwestern Electric		Cost of Capital, CWIP



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
P.U.C. General Counsel	11/90	Texas Utilities Electric Company	Docket No. 9300	Gas Purchasing Practices, Prudence
Oncor Electric Delivery Company	8/07	Oncor Electric Delivery Company	Docket No. 34040	Regulatory Policy, Rate of Return, Return of Capital and Consolidated Tax Adjustment
Oncor Electric Delivery Company	6/08	Oncor Electric Delivery Company	Docket No.35717	Regulatory policy
Oncor Electric Delivery Company	10/08 11/08	Oncor, TCC, TNC, ETT, LCRA TSC, Sharyland, STEC, TNMP	Docket No. 35665	Competitive Renewable Energy Zone
CenterPoint Energy	6/10 10/10	CenterPoint Energy/Houston Electric	Docket No. 38339	Regulatory Policy, Risk, Consolidated Taxes
Oncor Electric Delivery Company	1/11	Oncor Electric Delivery Company	Docket No. 38929	Regulatory Policy, Risk
Cross Texas Transmission	08/12 11/12	Cross Texas Transmission	Docket No. 40604	Return on Equity
Southwestern Public Service	11/12	Southwestern Public Service	Docket No. 40824	Return on Equity
Lone Star Transmission	5/14	Lone Star Transmission	Docket No. 42469	Return on Equity, Debt, Cost of Capital
CenterPoint Energy Houston Electric, LLC	6/15	CenterPoint Energy Houston Electric, LLC	Docket No. 44572	Distribution Cost Recovery Factor
Texas Railroad Commission				
Western Gas Interstate Company	1/85	Southern Union Gas Company	Docket 5238	Cost of Service
Atmos Pipeline Texas	9/10 1/11	Atmos Pipeline Texas	GUD 10000	Ratemaking Policy, risk



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Texas State Legislature				
CenterPoint Energy	4/13	Association of Electric Companies of Texas	SB 1364	Consolidated Tax Adjustment Clause Legislation
Utah Public Service Commission				
AMAX Magnesium	1/88	Mountain Fuel Supply Company	Case No. 86-057-07	Cost Allocation/Rate Design
AMAX Magnesium	4/88	Utah P&L/Pacific P&L	Case No. 87-035-27	Merger & Acquisition
Utah Industrial Group	7/90 8/90	Mountain Fuel Supply	Case No. 89-057-15	Gas Transportation Rates
AMAX Magnesium	9/90	Utah Power & Light	Case No. 89-035-06	Energy Balancing Account
AMAX Magnesium	8/90	Utah Power & Light	Case No. 90-035-06	Electric Service Priorities
Questar Gas Company	12/07	Questar Gas Company	Docket No. 07-057-13	Benchmarking in Support of ROE
Vermont Public Service Board				
Green Mountain Power	8/82	Green Mountain Power	Docket No. 4570	Rate Attrition
Green Mountain Power	12/97	Green Mountain Power	Docket No. 5983	Cost of Service
Green Mountain Power	7/98 9/00	Green Mountain Power	Docket No. 6107	Rate Development



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Wisconsin Public Service Commission				
WEC & WICOR	11/99	WEC	Docket No. 9401- YO-100 Docket No. 9402- YO-101	Approval to Acquire the Stock of WICOR
Wisconsin Electric Power Company	1/07	Wisconsin Electric Power Co.	Docket No. 6630-EI- 113	Sale of Nuclear Plant
Wisconsin Electric Power Company	10/09	Wisconsin Electric Power Co.	Docket No. 6630- CE-302	CPCN Application for Wind Project
Northern States Power Wisconsin	10/13	Xcel Energy (dba Northern States Power Wisconsin)	Docket No. 4220- UR-119	Fuel Cost Adjustments
Wisconsin Electric Power Company	11/13	Wisconsin Electric Power Co.	Docket No. 6630-FR- 104	Fuel Cost Adjustment
WE Energy	8/14 1/15	WE Energy/Integrus	Docket No. 9400- YO-100	Merger Approval



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
American Arbitration Association				
Michael Polsky	3/91	M. Polsky vs. Indeck Energy		Corporate Valuation, Damages
ProGas Limited	7/92	ProGas Limited v. Texas Eastern		Gas Contract Arbitration
Attala Generating Company	12/03	Attala Generating Co v. Attala Energy Co.	Case No. 16-Y-198-00228-03	Power Project Valuation, Breach of Contract, Damages
Nevada Power Company	4/08	Nevada Power v. Nevada Cogeneration Assoc. #2		Power Purchase Agreement
Sensata Technologies, Inc./EMS Engineered Materials Solutions, LLC	1/11	Sensata Technologies, Inc./EMS Engineered Materials Solutions, LLC v. Pepco Energy Services	Case No. 11-198-Y-00848-10	Change in Usage Dispute/Damages
Commonwealth of Massachusetts, Appellate Tax Board				
NStar Electric Company	8/14	NStar Electric Company		Valuation Methodology
Commonwealth of Massachusetts, Suffolk Superior Court				
John Hancock	1/84	Trinity Church v. John Hancock	C.A. No. 4452	Damages Quantification
State of Colorado District Court, County of Garfield				
Questar Corporation, et al	11/00	Questar Corporation, et al.	Case No. 00CV129-A	Partnership Fiduciary Duties



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
State of Delaware, Court of Chancery, New Castle County				
Wilmington Trust Company	11/05	Calpine Corporation vs. Bank Of New York and Wilmington Trust Company	C.A. No. 1669-N	Bond Indenture Covenants
Illinois Appellate Court, Fifth Division				
Norweb, PLC	8/02	Indeck No. America v. Norweb	Docket No. 97 CH 07291	Breach of Contract, Power Plant Valuation
Independent Arbitration Panel				
Alberta Northeast Gas Limited	2/98	ProGas Ltd., Canadian Forest Oil Ltd., AEC Oil & Gas		
Ocean State Power	9/02	Ocean State Power vs. ProGas Ltd.	2001/2002 Arbitration	Gas Price Arbitration
Ocean State Power	2/03	Ocean State Power vs. ProGas Ltd.	2002/2003 Arbitration	Gas Price Arbitration
Ocean State Power	6/04	Ocean State Power vs. ProGas Ltd.	2003/2004 Arbitration	Gas Price Arbitration
Shell Canada Limited	7/05	Shell Canada Limited and Nova Scotia Power Inc.		Gas Contract Price Arbitration
International Court of Arbitration				
Wisconsin Gas Company, Inc.	2/97	Wisconsin Gas Co. vs. Pan-Alberta	Case No. 9322/CK	Contract Arbitration
Minnegasco, A Division of NorAm Energy Corp.	3/97	Minnegasco vs. Pan-Alberta	Case No. 9357/CK	Contract Arbitration



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Utilicorp United Inc.	4/97	Utilicorp vs. Pan-Alberta	Case No. 9373/CK	Contract Arbitration
IES Utilities	97	IES vs. Pan-Alberta	Case No. 9374/CK	Contract Arbitration
State of New Jersey, Mercer County Superior Court				
Transamerica Corp., et al.	7/07 10/07	IMO Industries Inc. vs. Transamerica Corp., et al.	Docket No. L-2140- 03	Breach-Related Damages, Enterprise Value
State of New York, Nassau County Supreme Court				
Steel Los III, LP	6/08	Steel Los II, LP & Associated Brook, Corp v. Power Authority of State of NY	Index No. 5662/05	Property Seizure
Province of Alberta, Court of Queen's Bench				
Alberta Northeast Gas Limited	5/07	Cargill Gas Marketing Ltd. vs. Alberta Northeast Gas Limited	Action No. 0501- 03291	Gas Contracting Practices
State of Rhode Island, Providence City Court				
Aquidneck Energy	5/87	Laroche vs. Newport		Least-Cost Planning
State of Texas Hutchinson County Court				
Western Gas Interstate	5/85	State of Texas vs. Western Gas Interstate Co.	Case No. 14,843	Cost of Service



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
State of Texas District Court of Nueces County				
Northwestern National Insurance Company	11/11	ASARCO LLC	No. 01-2680-D	Damages
State of Utah Third District Court				
PacifiCorp & Holme, Roberts & Owen, LLP	1/07	USA Power & Spring Canyon Energy vs. PacifiCorp. et al.	Civil No. 050903412	Breach-Related Damages
U.S. Bankruptcy Court, District of New Hampshire				
EUA Power Corporation	7/92	EUA Power Corporation	Case No. BK-91-10525-JEY	Pre-Petition Solvency
U.S. Bankruptcy Court, District Of New Jersey				
Ponderosa Pine Energy Partners, Ltd.	7/05	Ponderosa Pine Energy Partners, Ltd.	Case No. 05-21444	Forward Contract Bankruptcy Treatment
U.S. Bankruptcy Court, No. District of New York				
Cayuga Energy, NYSEG Solutions, The Energy Network	09/09	Cayuga Energy, NYSEG Solutions, The Energy Network	Case No. 06-60073-6-sdg	Going Concern



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
U.S. Bankruptcy Court, So. District Of New York				
Johns Manville	5/04	Enron Energy Mktg. v. Johns Manville; Enron No. America v. Johns Manville	Case No. 01-16034 (AJG)	Breach of Contract, Damages
U.S. Bankruptcy Court, Northern District Of Texas				
Southern Maryland Electric Cooperative, Inc. and Potomac Electric Power Company	11/04	Mirant Corporation, et al. v. SMECO	Case No. 03-4659; Adversary No. 04-4073	PPA Interpretation, Leasing
U. S. Court of Federal Claims				
Boston Edison Company	7/06 11/06	Boston Edison v. Department of Energy	No. 99-447C No. 03-2626C	Spent Nuclear Fuel Litigation
Consolidated Edison of New York	08/07	Consolidated Edison of New York, Inc. and subsidiaries v. United States	No. 06-305T	Leasing, Tax Dispute
Consolidated Edison Company	2/08 6/08	Consolidated Edison Company v. United States	No. 04-0033C	SNF Expert Report
Vermont Yankee Nuclear Power Corporation	6/08	Vermont Yankee Nuclear Power Corporation	No. 03-2663C	SNF Expert Report
U. S. District Court, Boulder County, Colorado				
KN Energy, Inc.	3/93	KN Energy vs. Colorado GasMark, Inc.	Case No. 92 CV 1474	Gas Contract Interpretation



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
U. S. District Court, Northern California				
Pacific Gas & Electric Co./PGT PG&E/PGT Pipeline Exp. Project	4/97	Norcen Energy Resources Limited	Case No. C94-0911 VRW	Fraud Claim
U. S. District Court, District of Connecticut				
Constellation Power Source, Inc.	12/04	Constellation Power Source, Inc. v. Select Energy, Inc.	Civil Action 304 CV 983 (RNC)	ISO Structure, Breach of Contract
U.S. District Court, Northern District of Illinois, Eastern Division				
U.S. Securities and Exchange Commission	4/12	U.S. Securities and Exchange Commission v. Thomas Fisher, Kathleen Halloran, and George Behrens	Case No. 07 C 4483	Prudence, PBR
U. S. District Court, Massachusetts				
Eastern Utilities Associates & Donald F. Pardus	3/94	NECO Enterprises Inc. vs. Eastern Utilities Associates	Civil Action No. 92- 10355-RCL	Seabrook Power Sales
U. S. District Court, Montana				
KN Energy, Inc.	9/92	KN Energy v. Freeport MacMoRan	Docket No. CV 91- 40-BLG-RWA	Gas Contract Settlement



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
U.S. District Court, New Hampshire				
Portland Natural Gas Transmission and Maritimes & Northeast Pipeline	9/03	Public Service Company of New Hampshire vs. PNGTS and M&NE Pipeline	Docket No. C-02-105-B	Impairment of Electric Transmission Right-of-Way
U. S. District Court, Southern District of New York				
Central Hudson Gas & Electric	11/99 8/00	Central Hudson v. Riverkeeper, Inc., Robert H. Boyle, John J. Cronin	Civil Action 99 Civ 2536 (BDP)	Electric Restructuring, Environmental Impacts
Consolidated Edison	3/02	Consolidated Edison v. Northeast Utilities	Case No. 01 Civ. 1893 (JGK) (HP)	Industry Standards for Due Diligence
Merrill Lynch & Company	1/05	Merrill Lynch v. Allegheny Energy, Inc.	Civil Action 02 CV 7689 (HB)	Due Diligence, Breach of Contract, Damages
U. S. District Court, Eastern District of Virginia				
Aquila, Inc.	1/05 2/05	VPEM v. Aquila, Inc.	Civil Action 304 CV 411	Breach of Contract, Damages
U. S. District Court, Western District of Virginia				
Washington Gas Light Company	8/15 9/15	Washington Gas Light Company v. Mountaineer Gas Company	Civil Action No. 5:14-cv-41	Nominations and Gas Balancing, Lost and Unaccounted For Gas, Damages



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
U. S. District Court, Portland Maine				
ACEC Maine, Inc. et al.	10/91	CIT Financial vs. ACEC Maine	Docket No. 90-0304-B	Project Valuation
Combustion Engineering	1/92	Combustion Eng. vs. Miller Hydro	Docket No. 89-0168P	Output Modeling; Project Valuation
U.S. Securities and Exchange Commission				
Eastern Utilities Association	10/92	EUA Power Corporation	File No. 70-8034	Value of EUA Power
U.S. Tax Court in Illinois				
Exelon Corporation	4/15 6/15	Exelon Corporation, as Successor by Merger to Unicom Corporation and Subsidiaries et al. v. Commission of Internal Revenue	Docket Nos. 29183-13, 29184-13	Valuation of Analysis of Lease Terms and Quantify Plant Values
Council of the District of Columbia Committee on Consumer and Regulatory Affairs				
Potomac Electric Power Co.	7/99	Potomac Electric Power Co.	Bill 13-284	Utility Restructuring

1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **DIRECT TESTIMONY OF TERRY O. JONES**

4 **DOCKET NO. 150001-EI**

5 **OCTOBER 9, 2015**

6 **Q. Please state your name.**

7 A. My name is Terry O. Jones.

8 **Q. By whom are you employed and what is your position?**

9 A. I was employed by Florida Power & Light Company (“FPL”) in the nuclear fleet for
10 27 years. In 2013, I retired from FPL. I have been engaged by FPL as a consultant
11 and witness in this proceeding.

12 **Q. Please describe your educational background and professional experience.**

13 A. I joined FPL in 1987 in the Nuclear Operations Department at Turkey Point. My
14 positions at FPL have included Vice President, Extended Power Uprate; Vice
15 President of Operations, Midwest Region; Vice President, Nuclear Plant Support;
16 Vice President, Special Projects; Vice President, Turkey Point Nuclear Power Plant;
17 Plant General Manager; Maintenance Manager; Operations Manager and Operations
18 Supervisor. Prior to my employment at FPL, I worked for the Tennessee Valley
19 Authority at the Browns Ferry Nuclear Plant and served in the U.S. Nuclear Navy. I
20 hold a Bachelor of Science degree from Barry University and an MBA from the
21 University of Miami.

1 **Q. Please describe your experience relevant to your testimony in this docket.**

2 A. I have been directly involved in the planning, implementation and oversight of
3 hundreds of major nuclear projects, as well as the execution of numerous refueling
4 outages, in my various capacities.

5 **Q. What is the purpose of your testimony?**

6 A. The purpose of my testimony is to respond to Office of Public Counsel (“OPC”)
7 witness William Jacobs’s recommended disallowance of recovery through the fuel
8 clause for replacement power costs incurred as a result of the outage extension that
9 occurred at FPL’s St. Lucie Unit 2 in 2014 due to foreign material that was identified
10 and retrieved from the primary side of the steam generator (the “FM Event”). Based
11 on his review of the revised Root Cause Evaluation (“RCE”) of the FM Event,
12 witness Jacobs challenges decisions FPL made in the course of the incore
13 instrumentation (“ICI”) thimble replacement work performed by FPL’s vendor on the
14 upper guide structure of the reactor. I explain why witness Jacobs’s opinion is
15 misguided and lacking in merit.

16 **Q. Please summarize your response to witness Jacobs’s recommended disallowance.**

17 A. I have spent my entire career in the nuclear industry performing work in and related
18 to nuclear power plants. Based upon my 34 years of education, training, and
19 experience focused on ensuring safe, reliable, efficient operation of U.S. military and
20 commercial nuclear power plants as well as my thorough review of the
21 documentation for the FM Event, I conclude that FPL appropriately managed the ICI
22 thimble replacement work performed by a vendor.

23

1 The Commission should reject witness Jacobs’s recommendation that FPL refund the
2 replacement power costs associated with the FM Event. Based on the facts that I
3 describe, FPL has satisfied the prudence standard described by FPL witness Reed.
4 Witness Jacobs’s recommendation does not refer to or rely upon specific commercial
5 nuclear generation industry standards and fails to account for the possibility of human
6 error, which itself is not evidence of imprudence on the part of FPL. Based on
7 hindsight, witness Jacobs reaches the unsupported conclusion that FPL was
8 imprudent simply because an event occurred that in hindsight everyone wishes could
9 have been avoided.

10 **Q. Please briefly summarize the FM Event that extended the 2014 outage at St.**
11 **Lucie Unit 2.**

12 A. On April 8, 2014, FPL had concluded a refueling outage at St. Lucie Unit 2 and was
13 in the process of restarting the unit and restoring it to full power generation. During
14 the starting of the reactor coolant pumps, the system designed to detect loose parts
15 within the reactor coolant system performed as designed, indicating that there may be
16 a loose part in the B steam generator. Consistent with plant procedures, the pumps
17 were shut down to protect the Reactor Coolant System against damage from the
18 potential loose part, and the plant was cooled down and depressurized. Upon
19 inspection, a single loose part was found in the primary coolant side of Steam
20 Generator “B” channel head. The retrieved loose part was egg-shaped, a little over an
21 inch and a half long, and made of Type 304 stainless steel. Based on analysis by FPL
22 and its consultants, the deformed piece appeared to be a specialized “hurricane ball”
23 nozzle used for high pressure hydrolancing decontamination in nuclear plants.

1 **Q. Witness Jacobs describes two RCEs that were performed for the FM Event.**
2 **Please comment on the relationship between the two RCEs.**

3 A. In May 2014, FPL completed an RCE for the FM Event that allowed for the
4 possibility that the “hurricane ball” nozzle may have fallen into the UGS during the
5 2014 outage when it was identified by the loose part monitor and
6 retrieved. Accordingly, that evaluation focused on the foreign material exclusion
7 controls that were in place during the 2014 outage. Subsequently, however, FPL
8 conducted a follow-up review in which it determined that the nozzle could not have
9 fallen into the UGS during the 2014 outage but rather most likely was introduced
10 during an earlier, 2011 outage when the nature of the outage activities would have
11 created an opportunity for such an event. That determination led to a revised RCE,
12 dated July 2015.

13 **Q. Upon which RCE is witness Jacobs’s opinion about FPL’s handling of the FM**
14 **Event based?**

15 A. Witness Jacobs cites the conclusions of both RCEs in his testimony. However, his
16 testimony does not dispute the evidence in the revised RCE that the nozzle could not
17 have fallen into the UGS during the 2014 outage, which evidence undermines the
18 premise of the first RCE. His testimony specifically criticizes the conclusions of the
19 revised RCE. Accordingly, my testimony focuses on the revised RCE and witness
20 Jacobs’s misguided criticism of it.

21 **Q. Did you review the revised RCE?**

22 A. Yes. I also reviewed all of the attachments to the revised RCE, including the reports
23 prepared by FPL’s consultants.

1 **Q. What did the revised RCE conclude regarding the cause of the FM Event?**

2 A. According to the revised RCE, the foreign material was most likely introduced during
3 the 2011 St. Lucie Unit 2 outage (SL2-19) as a result of the work that was performed
4 to replace the ICI thimbles on the reactor's upper guide structure. FPL contracted
5 Westinghouse Electric Company ("Westinghouse") to perform this ICI thimble
6 replacement work.

7 **Q. Was Westinghouse an appropriate vendor to hire for the ICI thimble**
8 **replacement project?**

9 A. Yes. Westinghouse, as successor to Combustion Engineering Company, is the
10 original equipment manufacturer ("OEM") of the St. Lucie reactors. As the OEM,
11 Westinghouse has the proprietary design information, tools and processes to effect a
12 replacement of the ICI thimbles. Westinghouse has highly specialized expertise and
13 an excellent track record with similar work on other nuclear units within FPL and
14 throughout the industry.

15 **Q. Please provide more detail regarding Westinghouse's track record regarding**
16 **ICI thimble replacements.**

17 A. In 2007, Westinghouse successfully performed the ICI thimble replacement for St.
18 Lucie Unit 1. Additionally, Westinghouse had successfully performed this work for
19 seven non-FPL nuclear reactors since 2005. St. Lucie Unit 2 was the last of nine
20 nuclear reactors to have this modification performed by Westinghouse.

1 **Q. In addition to being the OEM and having completed ICI thimble replacement**
2 **work successfully in the past, what else made Westinghouse a qualified vendor?**

3 A. Westinghouse has a robust system of practices, procedures and quality assurance that
4 has resulted in numerous successful projects over the years.

5 **Q. Please describe generally the contractual arrangement that FPL had with**
6 **Westinghouse to perform the ICI thimble work.**

7 A. FPL utilized a “turnkey” concept for this scope of work, which means that FPL’s role
8 was limited once work began. This is appropriate when the nuclear services vendor is
9 highly specialized and ordinarily relied upon for its expertise. As I have explained,
10 Westinghouse already has established processes, procedures, equipment and
11 specialized tooling to accomplish this work. Westinghouse even has a complete
12 mock-up of the upper guide structure to facilitate training of the personnel who are
13 tasked with performing this work. Therefore, Westinghouse is uniquely qualified and
14 it was appropriate for FPL to rely on its expertise.

15 **Q. Did you review the procedures and processes that FPL and Westinghouse**
16 **prepared for the ICI thimble replacement work?**

17 A. Yes, I reviewed copies of the completed purchase order that was in place at the time;
18 the work orders that were used by Westinghouse, the procedures used by
19 Westinghouse, the foreign material exclusion (“FME”) plan submitted by
20 Westinghouse and approved by FPL, the division of responsibility plan, and
21 numerous other documents. I also interviewed FPL and Westinghouse employees
22 who were actively involved in the ICI thimble replacement project.

1 **Q. What did you conclude based on your review of the documentation?**

2 A. Westinghouse was responsible for execution of the ICI thimble replacement project,
3 including the foreign material exclusion controls associated with that project. The
4 procedures submitted by Westinghouse for the ICI thimble replacement project were
5 of sufficient detail and had been reviewed and approved by FPL. Also, based on
6 signatures, completed data sheets and field revisions to the procedures, I concluded
7 that the procedures were properly utilized by the Westinghouse crews during the
8 performance of that project.

9 **Q. What oversight of Westinghouse did FPL provide during the ICI thimble**
10 **replacement work?**

11 A. Prior to commencement of the work, FPL reviewed and approved Westinghouse's
12 procedures, processes and preparations. FPL had supervisors dedicated to the
13 oversight of Westinghouse to ensure compliance with the approved procedures and
14 processes. Specifically, personnel from FPL's reactor services group monitored the
15 work in real time twenty-four hours a day, ensuring prompt notification when
16 problems arose and ensuring compliance with radiological requirements and
17 adherence to the FME plan. In addition to FPL's line personnel, FPL's quality
18 assurance evaluators also performed surveillances of Westinghouse to verify
19 compliance with procedures and processes.

20 **Q. Did Westinghouse employ appropriate FME procedures for the ICI thimble**
21 **replacement project?**

22 A. Yes. In compliance with FPL's Nuclear Fleet procedure NA-AA-201, which governs
23 the acceptance of vendor work procedures, FPL reviewed and approved

1 Westinghouse's procedures, work packages and FME plan prior to commencing
2 work. For the ICI thimble replacement project, Westinghouse adopted St. Lucie's
3 FME Procedure, known as Procedure ADM-27.13, which complied with Electric
4 Power Research Institute and Institute of Nuclear Power Operations ("INPO")
5 standards applicable to nuclear power plants.

6 **Q. Please describe briefly the FME controls that Westinghouse employed for the**
7 **ICI thimble replacement project.**

8 A. Westinghouse continuously employed FME 1 controls throughout the ICI thimble
9 replacement project. This is the strictest level of control, which was appropriate due
10 to the complex configuration of the upper guide structure and limited inspection
11 capability and the consequences of the introduction of foreign materials.
12 Westinghouse performed a pre-FME inspection utilizing divers to document the
13 initial conditions of the upper guide structure support plate and the thimble support
14 plate.

15
16 Following a satisfactory finding of no foreign material, Westinghouse installed FME
17 plugs in the flow holes and other openings in the upper guide structure support plate,
18 as a barrier to foreign material potentially entering into the upper guide structure via
19 those openings. From the time Westinghouse installed the FME plugs through the
20 end of the project, Westinghouse maintained controls consistent with FME 1,
21 including the use of FME monitors and logs for all tools, equipment and material that
22 entered the ICI thimble replacement work area. Additionally, Westinghouse at all

1 times used tools designed to be fail safe and lanyard-tied equipment to perform the
2 work.

3 **Q. Please describe the inspections that Westinghouse was required to perform.**

4 A. Based on my examinations of the documentation for the ICI thimble replacement
5 work, Westinghouse was required to perform inspections and debris removal at
6 various stages in the project. Once the upper guide structure underwater work area
7 had been established, Westinghouse was required to perform a foreign object search
8 and retrieval (“FOSAR”) inspection of the accessible portion of the upper guide
9 structure.

10 **Q. Did this inspection occur?**

11 A. Yes. This “as found” inspection occurred just before the installation of the
12 specifically designed FME plugs and prior to the commencement of the thimble tube
13 removal, as directed by the procedure.

14 **Q. What other inspections were required by the procedure?**

15 A. Westinghouse was required to perform an FME inspection following the cutting of
16 the ICI thimbles, preparation of the remnants and the removal of the associated
17 debris.

18 **Q. Did this inspection occur?**

19 A. Yes. Westinghouse performed an FME inspection utilizing underwater cameras that
20 reached the upper guide structure support plate and also performed underwater
21 vacuuming to remove the debris that was generated during the cutting of the ICI
22 thimbles.

- 1 **Q. Did Westinghouse perform additional inspections?**
- 2 A. Yes. Following the installation of the new thimble tubes, a diver inspected the upper
- 3 guide structure and cavity floor for any remaining tooling or foreign material.
- 4 Westinghouse also performed a final inspection/walkdown of the flooded refueling
- 5 pool area, refuel bridge and auxiliary bridge to ensure that all tools, equipment,
- 6 components and debris were removed.
- 7 **Q. Did the inspections performed on the upper guide structure by Westinghouse**
- 8 **during the 2011 St. Lucie outage satisfy the industry standard for work**
- 9 **performed on critical components?**
- 10 A. Yes, using multiple underwater cameras, including FOSAR, to inspect the upper
- 11 guide structure and vacuuming to retrieve any loose debris satisfies the INPO
- 12 standard for FME controls employed during the performance of complex work.
- 13 **Q. Did FPL perform any inspections independent of Westinghouse?**
- 14 A. Yes, once Westinghouse had completed the ICI thimble replacement work and
- 15 returned the upper guide structure to FPL for installation into the reactor, FPL
- 16 personnel performed a visual inspection of the upper guide structure pursuant to
- 17 FPL's procedure for installation.
- 18 **Q. Did any of the above inspections reveal the presence of a hurricane ball nozzle?**
- 19 A. No. In spite of the FME controls in place and no fewer than four separate inspections
- 20 of the upper guide structure and surrounding area during the 2011 outage, neither
- 21 Westinghouse nor FPL identified a hurricane ball nozzle in the upper guide structure.

1 **Q. Did FPL inspect the upper guide structure during the 2012 and 2014 St. Lucie 2**
2 **outages (SL2-20 and SL2-21, respectively)?**

3 A. Yes. FPL performed a visual inspection of the accessible areas of the upper guide
4 structure as part of the normal refueling activities that occurred during 2012 and
5 2014. Neither of those inspections identified a hurricane ball nozzle in the upper
6 guide structure.

7 **Q. Is there an industry standard for inspections of the upper guide structure to be**
8 **performed upon reinstallation during a refueling outage?**

9 A. No, there is no established industry standard for such inspections. Nor is there a
10 consistent practice in the industry, or in some cases, even within enterprise fleets.
11 Based on a survey of other utilities conducted by FPL's maintenance corporate
12 functional area manager, the practices employed by other nuclear sites range from no
13 FME inspections at all, to visual inspections and underwater camera inspections. The
14 visual inspections performed by FPL upon reinstallation of the upper guide structure
15 were reasonable and fall within this range of typical industry practice.

16 **Q. Did FPL have reason to perform more intrusive inspections during either of**
17 **those outages in order to detect the presence of a hurricane ball nozzle in the**
18 **upper guide structure?**

19 A. No. Based on my review of the FPL documents and interviews of FPL personnel, no
20 work was performed on the upper guide structure during 2012 (SL2-20) and 2014
21 (SL2-21). Therefore, there was no occasion to perform a more intrusive inspection.
22 FPL management decisions can be based only on what is known at the time. FPL had
23 no reason to suspect that foreign material had been lodged in the upper guide

1 structure when it made the decision to perform visual inspections which fell well
2 within the range of typical industry practice.

3 **Q. Witness Jacobs asserts that because a similar nozzle was dropped into the**
4 **refueling cavity during the same outage, FPL should have been alerted to the**
5 **possibility that there would be another dropped nozzle. Do you agree?**

6 A. No. To the contrary, the fact that a dropped nozzle was reported, logged, located, and
7 retrieved provided assurance at the time that foreign material controls were working
8 as intended. The occurrence of this single dropped nozzle does not indicate a
9 systemic problem. Only with hindsight could one conclude that more intrusive
10 inspections might have been warranted.

11 **Q. Please respond to witness Jacobs's conclusion that a complete and thorough**
12 **inspection of the upper guide structure during the 2011, 2012 or 2014 outages**
13 **could have identified the foreign material and prevented the outage.**

14 A. The upper guide structure is not 100% inspectable. As I just described, Westinghouse
15 performed multiple camera inspections during 2011, and FPL performed visual
16 inspections of the accessible areas of the upper guide structure during 2011, 2012 and
17 2014, which were consistent with industry practice. Additional inspections of the
18 same nature likely would have yielded the same result. Any statement by witness
19 Jacobs that additional inspections could have prevented the FM Event is simply
20 speculation.

1 **Q. There is a “corrective action” in the revised RCE to require camera inspections**
2 **of the upper guide structure in the future. Does this indicate that a hurricane**
3 **ball nozzle likely would have been found if FPL had performed a camera**
4 **inspection of the upper guide structure?**

5 A. Absolutely not. As I previously discussed, Westinghouse performed an FME
6 inspection utilizing underwater cameras during the ICI thimble replacement work,
7 which did not detect a hurricane ball nozzle. Moreover, given that the upper guide
8 structure is not 100% inspectable, a camera inspection of the periphery of the upper
9 guide structure would be only a slight enhancement to a visual inspection. It would
10 not be able to detect small objects lodged within the upper guide structure.

11 **Q. In your opinion, what efforts would have had to be undertaken to identify the**
12 **hurricane ball nozzle in the upper guide structure?**

13 A. It depends on where the hurricane ball nozzle was lodged. If it was lodged inside
14 non-accessible areas, FPL would have to deploy boroscopic inspection tools with
15 radiation-hardened cameras and would have to perform high-risk diving operations in
16 high radiation fields, which would have taken many days to accomplish and thus
17 extended the 2011 outage. Even efforts of this magnitude could not result in a 100%
18 inspection of the upper guide structure.

19

20 It is important to keep in mind as well that, prior to the activation of the loose parts
21 monitor alarms at the end of the 2014 outage and subsequent location of the FM, FPL
22 had no reason to expect that a hurricane ball nozzle was missing. It is only with

1 hindsight that witness Jacobs can claim that FPL should have been undertaking
2 extraordinary inspections in search of foreign material.

3 **Q. Did the Westinghouse FME controls also provide for tools to be checked into**
4 **and out of the upper guide structure work area?**

5 A. Yes.

6 **Q. Did Westinghouse report any unresolved discrepancies in the FME control or**
7 **material control logs that would have suggested that a nozzle might have been**
8 **lost in the upper guide structure work area?**

9 A. No. At the end of each shift, all FME control and material control logs were
10 reconciled. The ICI thimble replacement project was closed out without any
11 unresolved discrepancies.

12 **Q. Witness Jacobs also speculates that FPL did not properly inventory tools and**
13 **attachments. What is the standard utility practice regarding accounting for**
14 **nozzles?**

15 A. A nozzle, or more specifically here, a hydrolancing nozzle, is one component of a
16 spray wand assembly. Because this is not a complex tool and each component is
17 mechanically secured, industry standard does not require sites to log the barrel,
18 trigger, nozzle and other components of a spray wand as separate items. Rather,
19 pursuant to INPO guidelines for foreign material control, the industry standard for the
20 deployment of a simple tool such as a spray wand is to inspect and log that tool as a
21 singular item and to inspect it upon exit to verify no equipment breakage. By
22 comparison, a complex tool such as an underwater robotic camera would be

1 photographed upon entry. Upon exit, it would be inspected against the photographs
2 to ensure no equipment breakage.

3
4 Witness Jacobs emphasizes the need to employ “good utility practices,” which he
5 explains are “practices, methods and acts engaged in or approved by a significant
6 portion of the electric utility industry,” but he fails to point to any industry practice
7 that requires nozzles to be logged individually.

8 **Q. Did the FME Plan employed by Westinghouse during the ICI thimble**
9 **replacement project comply with the industry standard you described?**

10 A. Yes, it did.

11 **Q. In your opinion as an experienced nuclear professional, were the decisions and**
12 **actions of FPL management appropriate based upon the information available**
13 **to FPL at the time?**

14 A. Yes. FPL’s decision in 2011 to select Westinghouse to perform the ICI thimble
15 replacement work was appropriate given Westinghouse’s knowledge, experience and
16 successful track record. FPL reviewed and approved Westinghouse’s processes,
17 procedures and policies to ensure that an appropriate FME Plan that more than
18 satisfied industry standard was in place. FPL provided constant management
19 oversight of Westinghouse, both from the line organization and from FPL’s quality
20 assurance organization. FPL performed visual inspections consistent with industry
21 practice in 2011, 2012 and 2014 during the reassembly of the upper guide structure.
22 Unfortunately, despite all of these efforts, it is apparent that human error by

1 contracted personnel performing the ICI thimble replacement project occurred such
2 that a foreign object was introduced and went undetected.

3 **Q. Does this conclude your testimony?**

4 A. Yes.