

## **Resume of Michael D. Cannata, Jr., P. E.**

### **Areas of Specialization**

Investigations of safety, reliability, and implementation of public policy in the electric and gas industries; facility siting, investigations of unit outage and system outage causes, electric utility operations and planning; bulk power system planning; interconnections; transmission system design.

### **Relevant Experience**

#### **Consulting**

- Currently assisting the Staff of the New Hampshire Public Utilities Commission in the evaluation of the proposed divestiture of the Public Service Company of New Hampshire's generating fleet.
- Primary consultant providing transmission and engineering services to the New Hampshire Public Utilities Commission, including prudence reviews of the operation of Public Service Company of New Hampshire's generating fleet since 2001.
- Conducted a review of the maintenance, planning, construction, and operating practices and procedures of Unitil Energy System's NH distribution companies for the New Hampshire Public Utilities Commission.
- Lead investigator into the staffing requirements and project requirements to underground a variable portion of the Potomac Electric Power Company system to meet specified restoration target times for the Maryland Public Service Commission.
- Lead investigator into the reliability and equipment replacement requirements related to the Delmarva Power and Light's 2013 rate case for the Delaware Public Service Commission.
- Assisted the New Hampshire Public Utilities Commission in its investigation into the prolonged outages resulting from the October 2011 snowstorm.
- Managing consultant on an investigation into the prolonged outage resulting from the October 2011 snowstorm on the Western Massachusetts Electric Company system on behalf of the Massachusetts Attorney General's Office.
- Lead investigator and advisor to the Maryland Public Service Commission in its investigation into the causes for large prolonged outages occurring in 2010 on the Potomac Electric Power Company system.
- Technical consultant to the Maryland Public Service Commission in the merger of First Energy and Allegheny Energy.
- Lead consultant in a review of the transmission system of Nova Scotia Power after the collapse of multiple transmission lines in November 2004 on behalf of the Nova Scotia Utility and Review Board. The review included system maintenance, inspection, structural design, materials, system planning and design, operations, utility communications, call center operations, staffing, outage management system, staffing, and lessons learned, and related matters
- Lead investigator into the reliability and maintenance practices of the Nova Scotia Power T&D system for the Nova Scotia Utility and Review Board.
- Lead investigator in the management audit of Consolidated Edison Company of New York reviewing adequacy of multi-area transmission planning and resource adequacy within the multi-area system for

the New York Public Service Commission, which also included a review of the electric and gas system designs.

- Lead investigator monitoring Commonwealth Edison's implementation of T&D system reliability improvement recommendations resulting from major system outages for the Illinois Commerce Commission.
- Lead investigator in the examination of the prolonged outage of Ameren T&D facilities following severe wind and ice events in 2006 for the Illinois Commerce Commission.
- Lead investigator monitoring Ameren's implementation of T&D system reliability improvement recommendations resulting from major system outages for the Illinois Commerce Commission.
- Lead investigator in the investigation of transmission grid security in Illinois after the August 2003 blackout for the Governor's blue ribbon committee.
- Lead investigator reviewing the adequacy of system interconnection requirements of a major renewable fuel resource for the Nova Scotia Utility and Review Board.
- Technical advisor to the Maine Public Utilities Commission, Vermont Public Service Board, Kentucky Public Service Commission, and the District of Columbia Public Service Commission regarding the public necessity and convenience for a multitude of 345 kV, 230 kV, 161 kV, 138 kV, 115 kV, and 69 kV facilities.
- Lead investigator reviewing the operation and outage of the fossil power plants of Arizona Public Service Company for the Arizona Public Service Commission.
- Lead investigator reviewing the operation and outage of the fossil power plants of Duke Energy-Ohio for the Ohio Public Utilities Commission.
- Lead investigator in the in-depth root cause analysis of a fire at a major Commonwealth Edison substation for the Illinois Commerce Commission.
- Lead investigator in the T&D system reliability reviews of four electric utilities in Maine.
- Investigator of the appropriateness of the proposed Storm Fund Adjustment Factor and the Inspection and Maintenance Program Basis Service Adjustment Mechanism for Power Option, a load aggregator in Massachusetts Electric Company's first delivery rate case in ten years.
- Technical advisor to the Maine Public Utilities Commission regarding the public convenience and necessity of the state-wide Maine Power Reliability Project consisting of 37 separate projects totaling more than 350 miles of 115 kV and 345 kV facilities and evaluation of those projects against non-transmission alternatives across the State of Maine.
- Technical advisor for Structural Bridge Corporation regarding electrical interconnection requirements for its plant expansion, making it the largest bridge manufacturer in North America.
- Lead investigator in the review of distribution and transmission practices at Alabama Power and Georgia Power Company.
- Advisor to the New Hampshire Public Utilities Commission in the merger of National Grid and Key Span and in the sale of Verizon's assets to Fair Point Communications.
- Lead investigator in prudence reviews of major fossil and nuclear plant outages and power purchases for the New Hampshire Public Utilities Commission.
- Principal technical and analytical member in the Seabrook nuclear unit sale team acting for the New Hampshire Public Utilities Commission.
- Investigator of the causes of overlapping unit outages at a major Reliant generation facility.

### **New Hampshire Public Utilities Commission - Chief Engineer**

- Managed a professional staff of engineers and analysts engaged in investigations regarding safety, reliability, emergency planning, and the implementation of public policy in the electric, gas, telecommunications and water industries.
- Prime architect of the settlement between the State of New Hampshire and Public Service Company of New Hampshire (PSNH) that ended years of litigation and allowed state-wide competition in the electric industry to proceed.
- A lead investigator for the Commission in the proposed merger of Consolidated Edison and Public Service Company of New Hampshire.
- Investigated the operation and outages of the fossil and nuclear facilities of the Public Service Company of New Hampshire.
- Advisor to the Commission on utility system and operational issues including those of alternative energy generation.
- Decision-maker on the Site Evaluation Committee responsible for siting major electric and gas production and transmission facilities.
- Decision-maker at the New Hampshire Office of Emergency Management's Emergency Operations Center.
- Re-drafted the state's Bulk Power Siting Statute and facilitated resolution of widespread legislative tensions.
- Sat as designated member for the New Hampshire Public Utilities Commission Chairman on the State Emergency Response Commission.
- Instrumental in achieving quality of service levels among the highest in Verizon's service territory.

### **Public Service Company of New Hampshire (PSNH)**

- As Director - Power Pool Operations and Planning, PSNH
  - Responsible for the operation and dispatch of PSNH transmission and generation facilities through the New Hampshire Electric System Control Center.
  - Core participant in the merger/acquisition team activities culminating in the corporate reorganization of PSNH. Recognized and developed a successful employee retention program used during the acquisition.
  - Core Task Force Member for the DC electrical interconnection between Hydro Quebec and the New England Power Pool.
  - Developed real time integrated transmission system loading capabilities for the New Hampshire Electric System Control Center.
  - Represented PSNH at all major relevant national and regional reliability organizations including:
    - New England Power Pool
      - System planning Committee
      - System Operations Committee

- All technical planning and operations task forces conducting regional and inter-regional studies and analyses
  - Northeast Power Coordinating Council
  - Joint Coordinating Council
  - Edison Electric Institute System Planning Committee
- As Director - System Planning/Energy Management, PSNH
  - Coordinated the company's capital planning requirements for generation and transmission, and integrated its load forecasting and energy management activities.
  - A lead participant in the development and implementation of response strategies addressing the negative financial impacts associated with the proliferation of non-utility generation.
  - Ensured that the interconnections of non-utility generation met utility reliability requirements.
  - Re-designed the corporate budgeting system to allocate available resources by economic and need prioritization.
  - Driving force in re-directing corporate economic evaluations towards competitive business techniques.
- As Manager - Computer Department and System Planning, PSNH
  - Responsible for the Engineering Division's computer applications support and transmission system planning functions.
  - Principal in the development, design and implementation of the first-in-the-nation application of 345/34.5 kV distribution. Resolved daytime corporate-wide computer throughput logjam.
  - Integrated the Engineering Department's computer applications into the corporate computer organization.

## **Education**

M.B.A., Northeastern University - 1975

M.S.E.E., Power System Major, Northeastern University - 1970

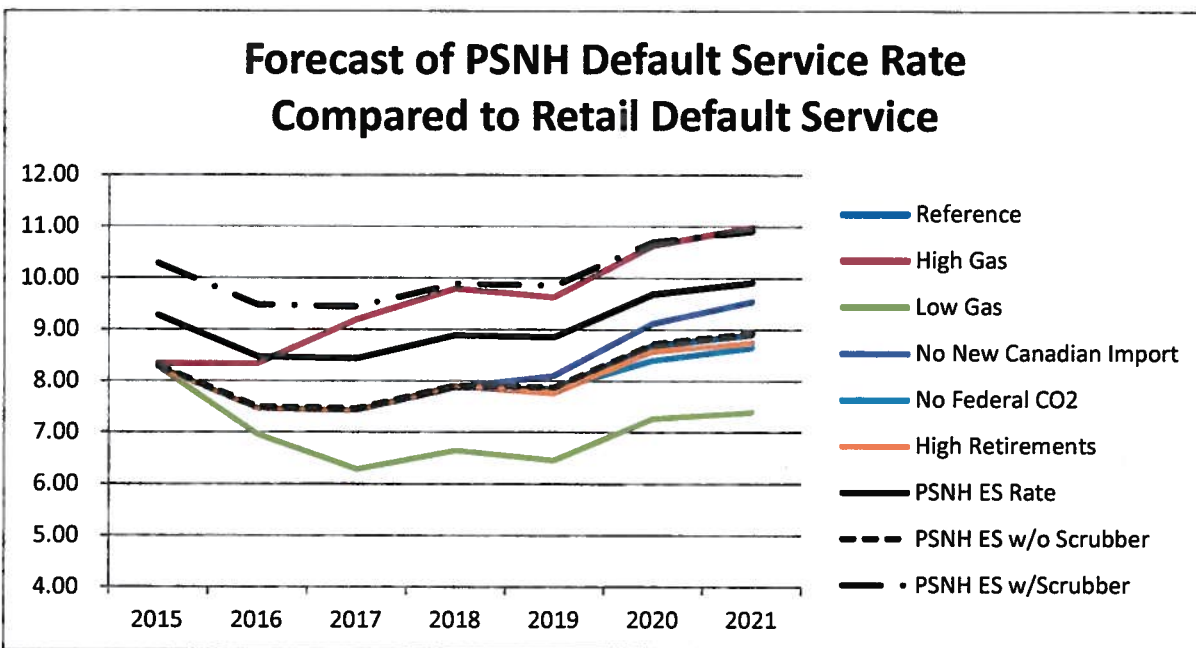
B.S.E.E., Power System Major, Northeastern University - 1969

## **Registration**

Registered Professional Engineer - New Hampshire #5618

As a further point of comparison between PSNH's ES rate and market prices, a review was performed on March 27, 2014 of competitive retail offerings by competitive electric power suppliers (CEPS) registered to serve customers in New Hampshire. The CEPS offer a variety of pricing alternatives that include fixed or variable pricing, differing durations of fixed prices, and products promoted as being from renewable sources. PSNH's ES rate is initially set for an annual period but subject to an adjustment mid-year, so it is effectively fixed for a six-month period. As of March 27, 2014, supply options from the CEPS with fixed pricing for less than a twelve-month period were between 0.24 cents per kWh and 1.33 cents per kWh lower than PSNH's current ES rate of 9.23 cents per kWh. Again, these offerings are by no means perfect comparisons with PSNH's ES rate,<sup>2</sup> but they are mentioned for informational purposes.

Since mid-April 2012, PSNH's ES rate includes a temporary adder of 0.98 cents per kWh for cost recovery associated with a wet flue gas desulfurization scrubber (Scrubber) installed at its Merrimack Station generating plant at a cost of approximately \$420 million. Final cost recovery associated with the Scrubber is the subject of an ongoing proceeding at the Commission, DE 11-250 (see: <http://www.puc.nh.gov/Regulatory/Docketbk/2011/11-250.html>), so the final rate impacts associated with that project are unknown at this time. However, using the forecasted retail default service rates from the chart above, it is informative to use the comparison of PSNH's ES rate to the default service rates of UES and GSEC along with some ranges of recovery for the Scrubber project and add some more lines to the chart as shown below:



<sup>2</sup> For example, a CEPS may have underlying contracts with power producers for certain amounts of power over certain periods of time. It could also view PSNH's ES rate as a "price to beat" and price its offering slightly below PSNH's ES rate and try to maximize its profit margin. Pricing strategies differ among suppliers and among competitive offerings.

**Exhibit MDC-3A****ADJUSTMENTS TO EXHIBIT EHC-1, PAGE 1 FOR ERRORS/OMISSIONS****RESTATED ESTIMATED CUSTOMER SAVINGS IF PSNH GENERATION IS SOLD****(DOLLARS X 10<sup>6</sup>)**

<b>Adj. #</b>	<b>Description</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>Total Adjustments</b>	<b>Est. 5-Year Savings</b>
---	Base Savings <sup>1</sup>	16.5	30.5	65.9	50.3	63.8	73.6	78.3	---	<b>378.9</b>
A	No Rate Case	-19.3	-38.6	-19.3	---	---	---	---	<b>-77.2</b>	---
Subtotal	---	-2.8	-8.1	46.6	50.3	63.8	73.6	78.3	---	<b>301.7</b>
B	Partially Missed Load Obligation Payments with Sale	---	---	---	-40.2	-62.0	-53.4	-50.5	<b>-206.3</b>	---
Subtotal	---	-2.8	-8.1	46.6	10.1	1.8	20.2	27.8	---	<b>95.4</b>
C	Savings From High Market Prices and Missed Winter Price Spikes	---	---	-116.6	-116.6	-116.6	-116.6	-116.6	<b>-583.0</b>	---
Subtotal	---	-2.8	-8.1	-70.0	-106.5	-114.8	-96.4	-88.8	---	<b>-487.6</b>
D	Use of Low Gas Price Only on Competitive ES Rates	---	---	-13.0	-11.0	-14.0	-16.0	-16.0	<b>-70.0</b>	---
Subtotal	---	-2.8	-8.1	-83.0	-117.5	-128.8	-112.4	-104.8	---	<b>-557.6</b>
E	Corrected for a7-Year Scrubber Deferral Amort. Period <sup>2</sup>	---	---	-24.0	-24.0	-24.0	-24.0	-24.0	<b>-120.0</b>	---

<sup>1</sup> From Exhibit EHC-1, page 1, line 23.<sup>2</sup> The estimated total 15-year savings of \$1.211 billion is reduced by an additional \$384.0 million in the years 2022 through 2031.

Total	---	-2.8	-8.1	-107.0	-141.5	-152.8	-136.4	-128.8	-1056.5	-677.6
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**Exhibit MDC-3B****ADJUSTMENTS TO EXHIBIT EHC-1, PAGE 1 FOR ERRORS/OMISSIONS****RESTATED ESTIMATED CUSTOMER COMPETITIVE ES RATE INCREASES IF PSNH GENERATION IS SOLD (Cents/KWh)**

<b>Adj. #</b>	<b>Description</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
---	Base ES Rates with REP <sup>1</sup>	10.37	9.60	7.27	7.65	7.32	7.99	8.08
A	No Rate Case	---	---	----	---	---	---	---
Subtotal	---	10.37	9.60	7.27	7.65	7.32	7.99	8.08
B	Partially Missed Load Obligation Payments with Sale	---	---	---	1.01	1.55	1.34	1.26
Subtotal	---	10.37	9.60	7.27	8.66	8.87	9.33	9.34
C	Savings From High Market Prices and Missed Winter Price Spikes	---	---	2.92	2.92	2.92	2.92	2.92
Subtotal	---	10.37	9.60	10.19	11.58	11.79	12.25	12.26
D	Use of Low Gas Price Only on Competitive ES Rates	---	---	0.33	0.28	0.35	0.40	0.40
Subtotal	---	10.37	9.60	10.52	11.86	12.14	12.65	12.66
E	Corrected for a 7-Year Scrubber Deferral Amort. Period <sup>2</sup>	---	---	0.60	0.60	0.60	0.60	0.60
Subtotal	---	10.37	9.60	11.12	12.46	12.74	13.25	13.26
---	PSNH ES Rates with Full Scrubber Costs	10.30	9.40	9.40	9.90	10.80	11.00	11.00

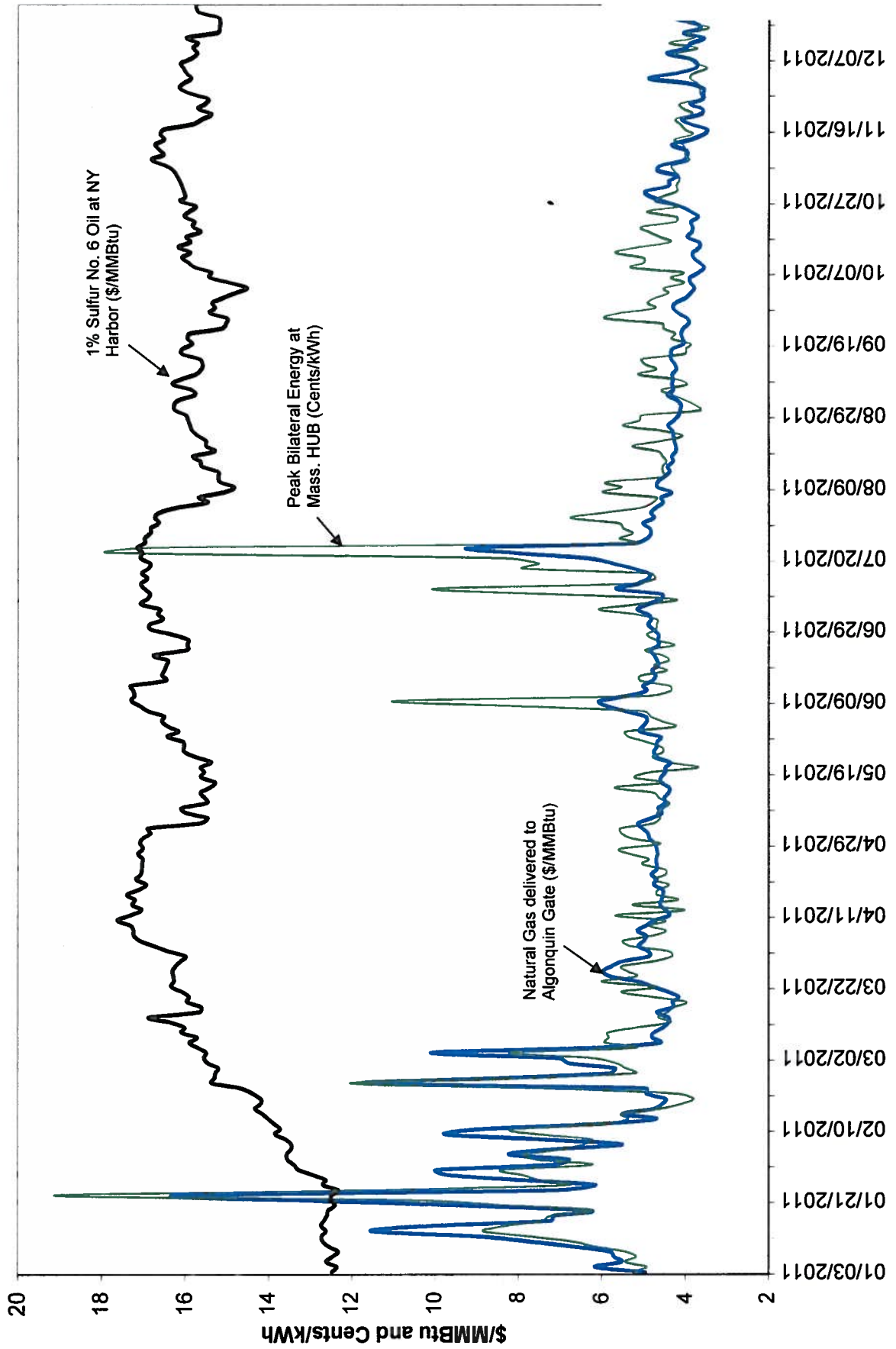
<sup>1</sup> 2015 and 2016 from April 1, 2014, Staff Report. Remainder from Exhibit EHC-1, page 1, line 12, plus adjustment for REP expenditures in 2015-2017.

<sup>2</sup> The estimated total 15-year savings of \$1.211 billion is reduced by an additional \$384.0 million in the years 2022 through 2031.



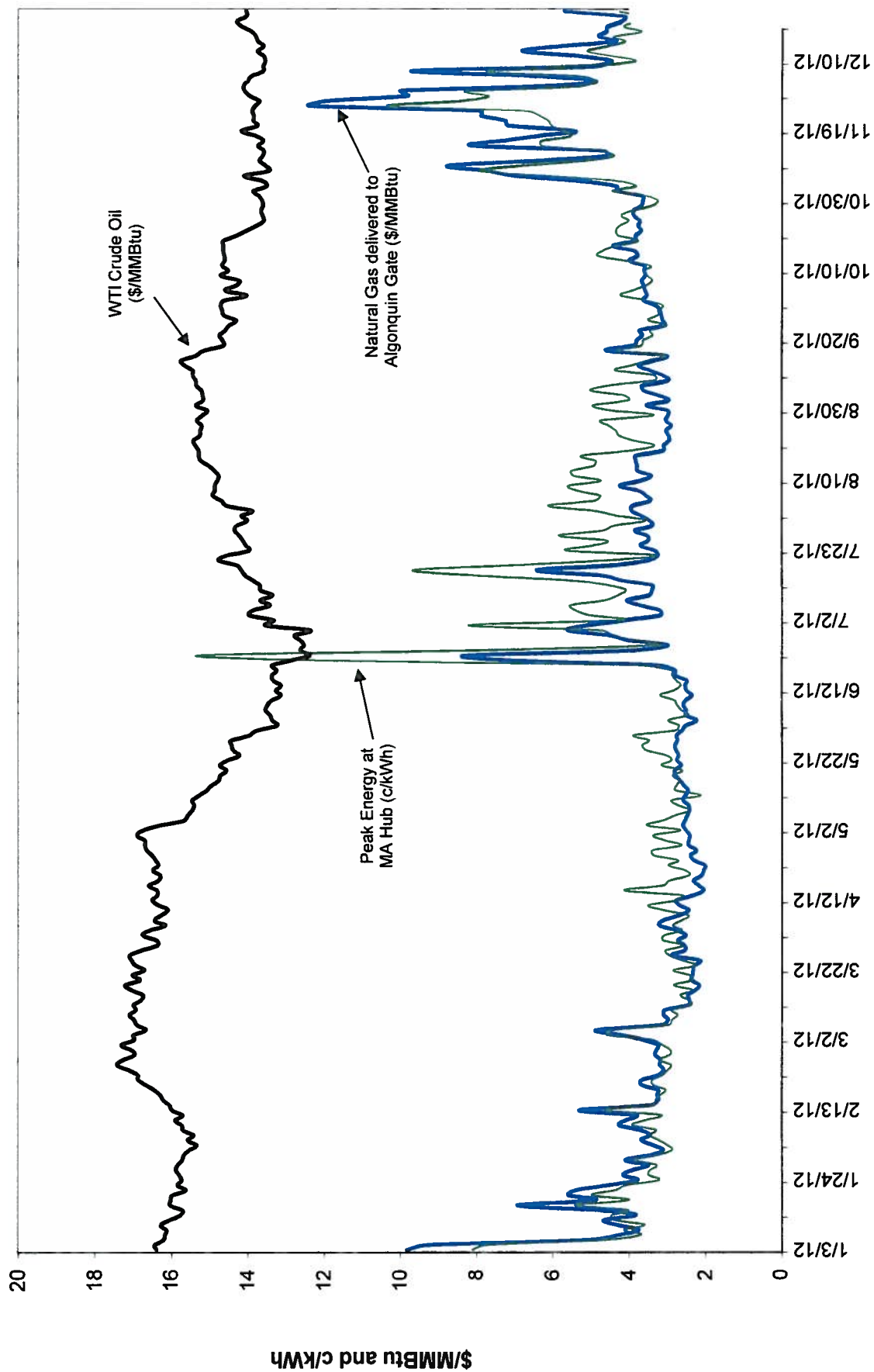
	<b>ES Rate Increase</b>	<b>0.07</b>	<b>0.20</b>	<b>1.72</b>	<b>2.56</b>	<b>1.94</b>	<b>2.25</b>	<b>2.26</b>

**Attachment FBW-4**  
**2011 Daily Prices (Natural Gas, 1% Oil, Day-Ahead Peak Energy)**



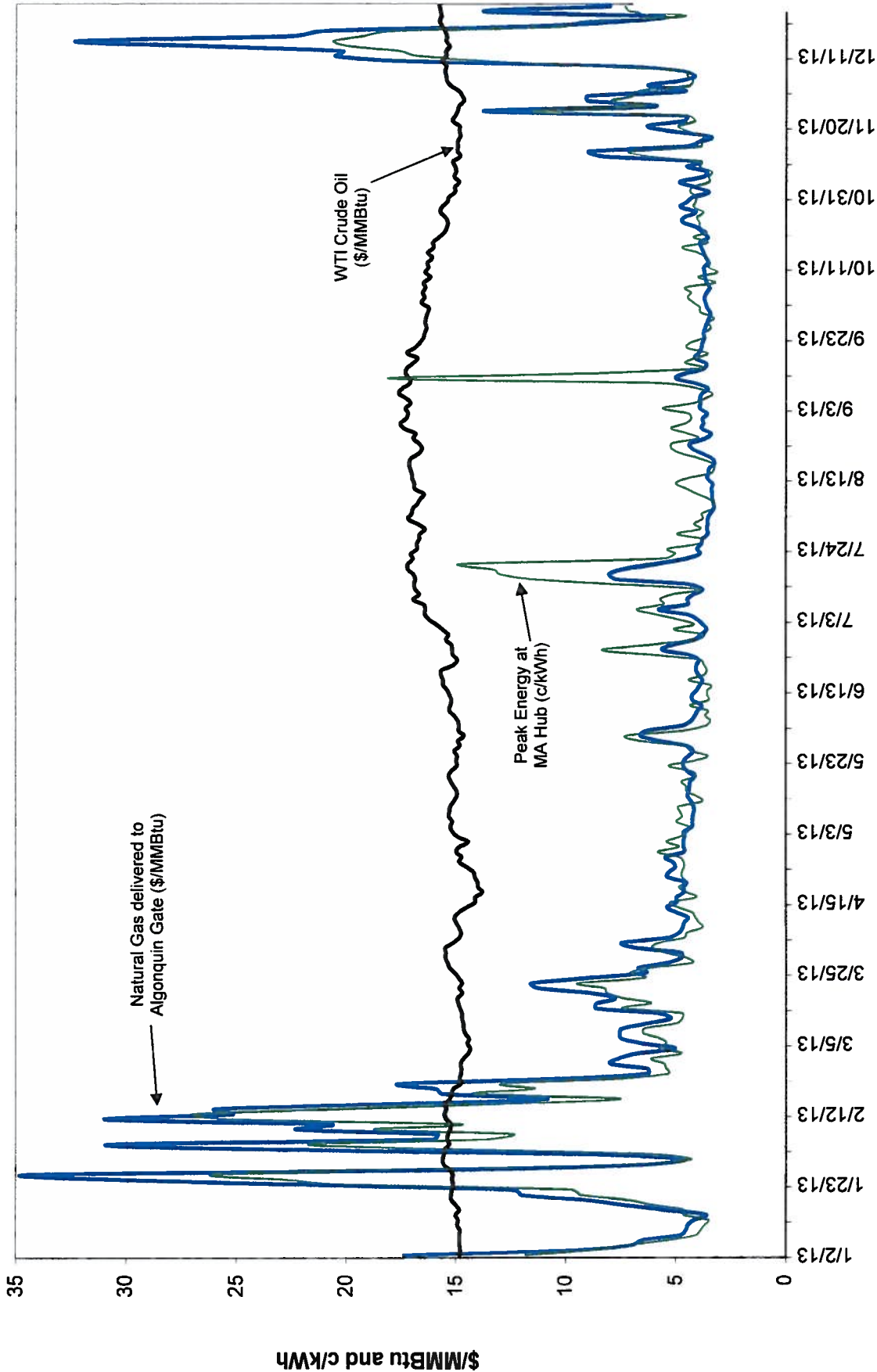
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**Attachment FBW-4**  
**2012 Daily Prices (Natural Gas, Crude Oil, Day-Ahead Peak Energy)**

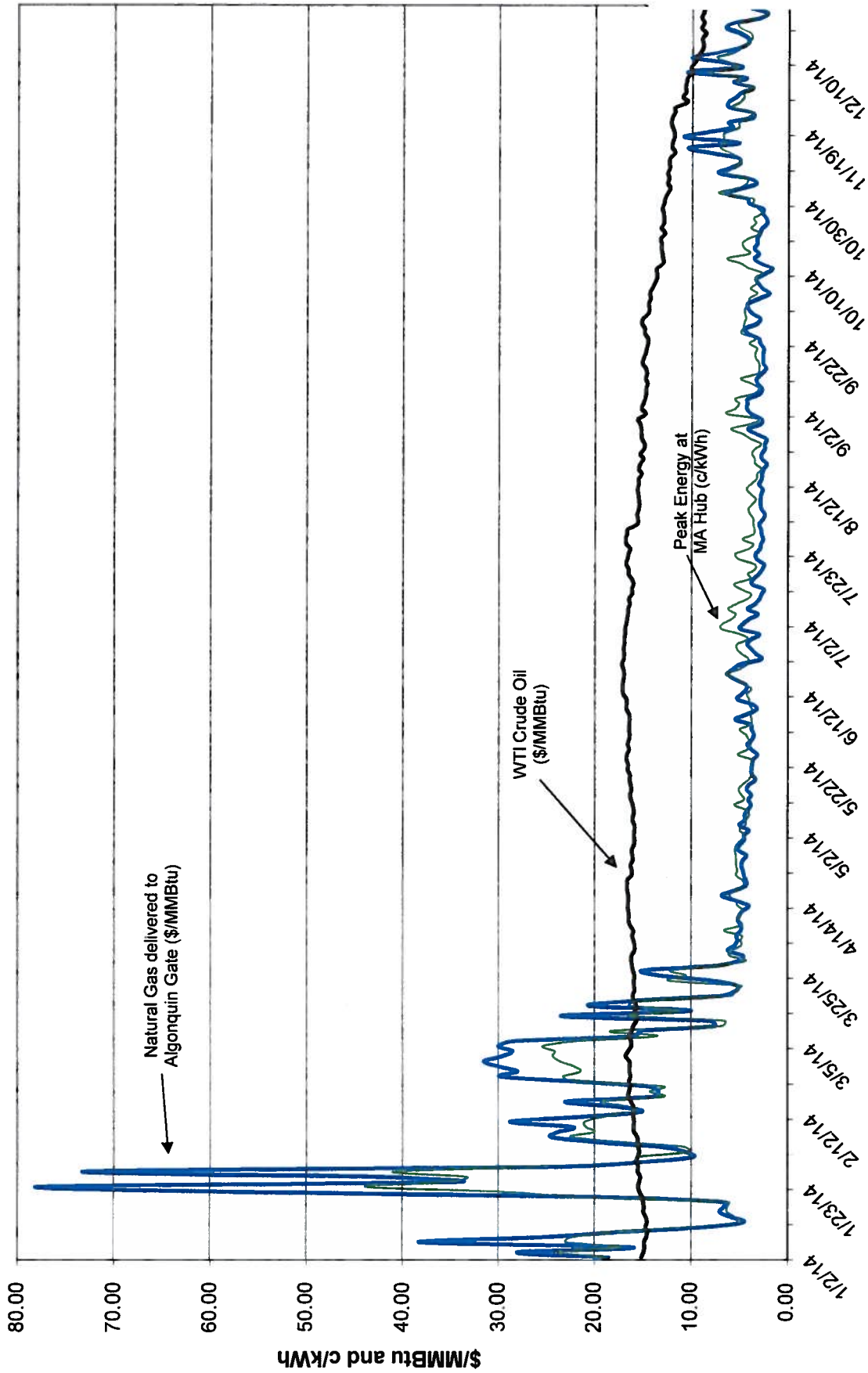


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Attachment FBW-4  
2013 Daily Prices (Natural Gas, Crude Oil, Day-Ahead Peak Energy)



**Attachment FBW-4**  
**Daily Prices (Natural Gas, Crude Oil, Day-Ahead Peak Energy) - 2014**



# Steam Unit Graphs Planned Outages Included

