

ORIGINAL

Witness: Richard L. Levitan  
Request from: New Hampshire Public Utilities Commission Staff

N.H.P.U.C. Case No.	DE 10-261
Exhibit No.	PSNH-19
Witness	Tanel 9
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**Question:**

Provide the 2010 backcast analysis and results performed by Levitan and Associates at the request of NHPUC Staff for the scenario using 2010 forward prices, with and without the change in start fuel costs identified by Levitan.

**Response:**

For the 2010 backcast analysis requested by NHPUC Staff using the averages of November and December 2009 forward price curves as the 2010 expected monthly prices, LAI used the same procedures for developing Newington node DA and RT energy prices based on MassHub on-peak and off-peak forward prices, and for developing Dracut gas prices based on Henry Hub futures, and developing RFO and 2FO prices based on WTI futures. The price simulation start date was set to December 1, 2009 and the dispatch simulation start and end dates were set to January 1, 2010 and December 31, 2010. All other data were kept the same as for the ten-year study period. Results of the 2010 backcast analysis are shown in Attachment 1. For comparison, 2010 actual performance of Newington Station is also reported with data sources.

LAI observed that while differences in the number of starts and average loads may be explained by the ISO-NE calling upon Newington Station to provide operating reserves during much of 2010, that 2FO use per start appeared low. After consultation with PSNH, LAI learned that the previous data for cold and hot start fuel use did not include fuel for ramping between 20 MW and 60 MW, and that the share of 2FO use is higher than previously modeled. Results of the 2010 backcast analysis with revised start fuel usage are shown in Attachment 2. However, no generation or energy revenue credit was given for the small amount of generation between the 20 MW level when the unit goes online and the 60 MW minimum stable operating level.

Neither of these two backcast cases includes the 2FO fuel use or cost for plant warming.

**Attachments:**

1. 2010 backcast results for case with average Nov.-Dec. 2009 forward prices as forecast
2. 2010 backcast results for case with average Nov.-Dec. 2009 forward prices as forecast, and revised start fuel use

**Attachment 1****Newington Station 2010 Backcast Analysis****Case: Average Nov.-Dec. 2009 Forwards as Forecast**

Staff Item	Measure	Source	Actual	EV	P5	P25	P50	P75	P95
c	Dispatch Hours	[1]	1,609	935	532	805	868	1,039	1,568
d	Generation [GWh]	[2]	224.667	272.478	167.567	231.552	255.969	295.791	457.925
e	Number of Starts	[3]	123	37	25	35	22	58	62
f	2FO Consumption [BBtu]	[4]	134	10	6	10	6	12	16
f	RFO Consumption [BBtu]	[4]	489	47	132	10	3	28	91
f	Gas Consumption [BBtu]	[4]	2,398	3,002	1,727	2,589	2,847	3,290	5,044
g	CO2 Emitted [1000 ton]	[1]	217	180	113	153	167	196	304
g	SO2 Emitted [ton]	[1]	325	38	76	17	9	32	71
g	NOx Emitted [ton]	[1]	187	182	118	152	169	195	308
h	Capacity Factor [%]	[3]	6.4%	7.8%	4.8%	6.6%	7.3%	8.4%	13.1%
i	Service Factor [%]	[3]	17.5%	10.7%	6.1%	9.2%	9.9%	11.9%	17.9%
	Availability	[3]	96.2%	94.0%	91.3%	96.2%	96.2%	93.2%	93.2%
b	Energy Revenue [\$1000]	[2]	21,459	24,502	12,537	19,178	21,548	27,725	44,150
a	Energy Cost [\$1000]		19,963	19,144	10,502	15,515	16,359	21,021	35,084
a	Fuel Cost [\$1000]	[2]	19,787	18,787	10,279	15,213	16,030	20,635	34,484
a	Emission Allow Cost [\$1000]	[5]	176	356	224	302	330	386	601
	Net Revenue [\$1000]		1,496	5,358	2,035	3,663	5,189	6,704	9,066
	Ave. Energy Revenue [\$1000]		95.51	89.92	74.82	82.82	84.18	93.73	96.41
	Ave. Fuel Cost [\$1000]		88.07	68.95	61.34	65.70	62.62	69.76	75.30
	Ave. Energy Cost [\$1000]		88.86	70.26	62.68	67.00	63.91	71.07	76.62
	Ave. Energy Margin [\$1000]		6.66	19.67	12.14	15.82	20.27	22.67	19.80
	Ave. Generation [MW]		140	291	315	288	295	285	292
	Ave. Start 2FO Use [Bbtu]		1.09	0.28	0.26	0.27	0.28	0.20	0.26
	Natural Gas Use Share		79.4%	98.1%	92.6%	99.3%	99.7%	98.8%	97.9%
	Ave. Heat Rate [MMBtu/MWh]		13.45	11.23	11.13	11.26	11.16	11.26	11.25
	Ave. Energy Cost [\$1000]		6.61	6.26	5.63	5.95	5.73	6.31	6.81

## Sources of 2010 actuals:

- [1] PSNH supplied data
- [2] OCA-02-033, OCA-02-033-SP01
- [3] STAFF-01-068
- [4] STAFF-03-001
- [5] STAFF-01-061-SP01

## Notes re differences between actual and backcast expected value (EV) results:

- 1 Actual 2FO use and cost includes fuel for plant warming. The model did not include warming fuel use or cost.
- 2 Actual energy revenue includes NCPC payments. Actual costs and average heat rate reflect lower part-load efficiency.

**Attachment 2****Newington Station 2010 Backcast Analysis****Case: Average Nov.-Dec. 2009 Forwards as Forecast; Revised Start Fuel Data**

Staff Item	Measure	Source	Actual	EV	P5	P25	P50	P75	P95
c	Dispatch Hours	[1]	1,609	844	341	675	974	1,063	1,227
d	Generation [GWh]	[2]	224.667	247.539	98.040	197.276	281.922	316.903	359.736
e	Number of Starts	[3]	123	32	14	25	38	45	34
f	2FO Consumption [BBtu]	[4]	134	21	11	17	25	27	26
f	RFO Consumption [BBtu]	[4]	489	46	0	10	18	181	85
f	Gas Consumption [BBtu]	[4]	2,398	2,741	1,116	2,218	3,166	3,351	3,963
g	CO2 Emitted [1000 ton]	[1]	217	166	66	132	189	214	241
g	SO2 Emitted [ton]	[1]	325	45	10	21	36	126	74
g	NOx Emitted [ton]	[1]	187	168	66	132	189	221	246
h	Capacity Factor [%]	[3]	6.4%	7.1%	2.8%	5.6%	8.0%	9.0%	10.3%
i	Service Factor [%]	[3]	17.5%	9.6%	3.9%	7.7%	11.1%	12.1%	14.0%
	Availability	[3]	96.2%	93.8%	96.2%	96.2%	96.2%	93.0%	94.5%
b	Energy Revenue [\$1000]	[2]	21,459	22,640	8,361	16,650	23,545	30,423	31,917
a	Energy Cost [\$1000]		19,963	17,666	6,548	13,327	18,738	24,068	23,371
a	Fuel Cost [\$1000]	[2]	19,787	17,338	6,417	13,066	18,366	23,645	22,895
a	Emission Allow Cost [\$1000]	[5]	176	328	131	260	372	423	477
	Net Revenue [\$1000]		1,496	4,974	1,813	3,324	4,807	6,355	8,546
	Ave. Energy Revenue [\$1000]		95.51	91.46	85.28	84.40	83.52	96.00	88.72
	Ave. Fuel Cost [\$1000]		88.07	70.04	65.46	66.23	65.15	74.61	63.64
	Ave. Energy Cost [\$1000]		88.86	71.37	66.79	67.55	66.47	75.95	64.97
	Ave. Energy Margin [%]		6.66	20.09	18.49	16.85	17.05	20.05	23.76
	Ave. Generation [MW]		140	293	288	292	289	298	293
	Ave. Start 2FO Use [Bbtu]		1.09	0.65	0.77	0.69	0.67	0.59	0.77
	Natural Gas Use Share		79.4%	97.6%	99.0%	98.8%	98.7%	94.2%	97.3%
	Ave. Heat Rate [MMBtu/MWh]		13.45	11.34	11.50	11.38	11.38	11.23	11.33
	Ave. Energy Cost [\$1000]		6.61	6.29	5.81	5.94	5.84	6.76	5.74

## Sources of 2010 actuals:

- [1] PSNH supplied data
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- [3] STAFF-01-068
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