UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Price Formation in Energy and Ancillary Services	)	Docket No. AD14-14-000
Markets Operated by Regional Transmission	)	
Organizations and Independent System Operators	)	

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Since its inception, the foundational objectives of the electric utility industry have been to provide reliable service to consumers, at a reasonable cost, while providing adequate compensation to asset owners and according appropriate recognition of local, state and national policy and risk objectives, such as fuel diversity, managing price volatility and regional competitiveness. In the late 1990's, New England stakeholders and policymakers sought to achieve these objectives through a structure based on short-term price signals. As a result, price formation in the energy and ancillary services markets, including the impact of uplift on system operations and consumer costs, has become an important consideration in evaluating how the wholesale electric market system is meeting these foundational objectives.

My observations and conclusions, detailed below, are as follows:

- Uplift represents a very small share of the overall wholesale market charges (capacity, energy and ancillary service costs) imposed on New England consumers.
- There is a strong correlation between the level of real-time economic uplift in New England and the level of supplemental commitments made by the ISO to meet operating reserve and replacement reserve requirements.

- Commission concerns over uplift can best be addressed by assuring that the commitment schedule developed as part of the day-ahead market settlements reflect, as closely as possible, the conditions that the system operators will face in real-time.
- CMEEC is not supportive of efforts to mitigate uplift by artificially inflating energy market prices. While such efforts may meet the hedging needs of entities with short-term transactional and commodity business models, they would be detrimental to New England consumers and, from our perspective would upset the balance between reliability, cost to consumers, compensation to asset owners and respecting policy and risk objectives.

ROLE OF UPLIFT IN MEETING THE FOUNDATIONAL OBJECTIVES

Uplift occurs when demand and supply resources on the bulk power system are unable to adjust output in time to meet system operational needs, or revenues received from the energy and reserve markets are insufficient to cover a needed resource's variable cost. The level of uplift can be influenced by factors including market design, market pricing, unit commitment decisions and resource mix. Even though it was not called out separately, uplift was present even in the pre-market New England system which had a cost-based, pay-as-bid, split the savings structure. Uplift can also arise if actual system conditions deviate from what was expected when initial security-constrained commitment and dispatch decisions were made and if the unit commitment and dispatch models cannot accommodate the physical operating characteristics of resources and/or the bulk power system. The mix of resources on the system can also affect the level of uplift. A system comprised of very flexible resources with higher variable costs and low start-up costs would tend to have a lower level of uplift than a system with less flexible resources, lower

variable costs and higher start-up costs, however, the latter system should result in lower overall costs to consumers despite higher uplift charges.

Uplift also has implications for how and whether the wholesale market system meets the foundational objectives for our industry. Reliability concerns that are not addressed in the unit commitment and dispatch process can give rise to uplift. The cost of uplift is allocated to electric consumers and can affect prices in the energy and reserve markets. Uplift provides "make-whole" payments to assure that system resources at least recover their variable cost when they respond to ISO dispatch instructions. And finally, resources installed to meet policy objectives such as fuel diversity and environmental compliance can also influence the level of uplift. As a result, it is important to view uplift in the context of overall market related costs including capacity, energy and ancillary service market costs.

IMPACT OF UPLIFT ON ELECTRIC CONSUMERS

In New England, uplift charges are generally referred to as Net Commitment Period Compensation, or NCPC. (Those terms are used interchangeably for this paper.) The cost and price data presented here were taken from actual ISO-NE settlement reports for the period from January 2012 through June 2014.

When viewed from the perspective of overall wholesale market charges (namely capacity, energy and ancillary service market costs), even in extreme cases, uplift represents a very small fraction of overall charges. Over the period from January 2012 through June 2014, CMEEC's total load-based charges from the ISO-NE Capacity, Energy and Ancillary Services markets averaged $70.69 per MWh. Of these total cost, uplift charges from the day-ahead and real-time markets was $0.37 per MWh, or 0.54% of the total. On a monthly basis, these total

uplift charges have ranged from a high of $2.16 per MWh (or 1.16% of total monthly wholesale market charges) in January 2014 to a low of $0.03 per MWh (or 0.06% of total monthly wholesale market charges) in February 2012. Figure 1 provides a breakdown of CMEEC's monthly wholesale market charges (expressed in $ per MWh) and the share of total charges represented by uplift (expressed as % of total charges.) Table 1 provides a more detailed breakdown of this data on a monthly basis.

Figure 1

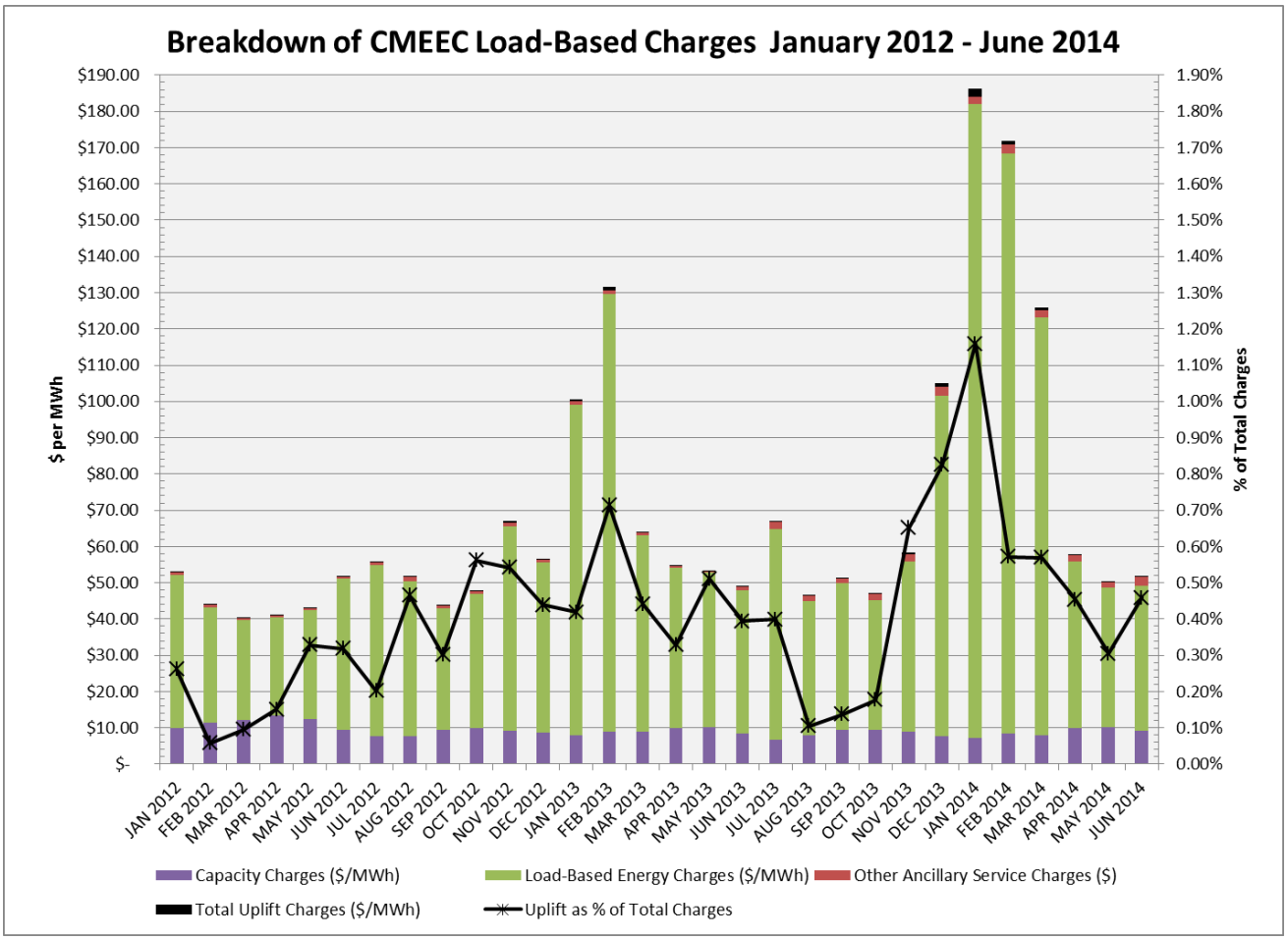

Breakdown of CMEEC Load-Based Charges January 2012 - June 2014
$ per MWh
% of Total Charges
$190.00
$180.00
$170.00
$160.00
$150.00
$140.00
$130.00
$120.00
$110.00
$100.00
$90.00
$80.00
$70.00
$60.00
$50.00
$40.00
$30.00
$20.00
$10.00
$-
1.90%
1.80%
1.70%
1.60%
1.50%
1.40%
1.30%
1.20%
1.10%
1.00%
0.90%
0.80%
0.70%
0.60%
0.50%
0.40%
0.30%
0.20%
0.10%
0.00%
JAN 2012
FEB 2012
MAR 2012
APR 2012
MAY 2012
JUN 2012
JUL 2012
AUG 2012
SEP 2012
OCT 2012
NOV 2012
DEC 2012
JAN 2013
FEB 2013
MAR 2013
APR 2013
MAY 2013
JUN 2013
JUL 2013
AUG 2013
SEP 2013
OCT 2013
NOV 2013
DEC 2013
JAN 2014
FEB 2014
MAR 2014
APR 2014
MAY 2014
JUN 2014
Capacity Charges ($/MWh)
Load-Based Energy Charges ($/MWh)
Other Ancillary Service Charges ($)
Total Uplift Charges ($/MWh)
Uplift as % of Total Charges

Table 1

Breakdown of CMEEC Load-Based Market Charges
January 2012 - June 2014

	Total Uplift Charges		Other Ancillary Service Charges		Energy Charges		Capacity Charges		Total	
	$ per MWh	% of Total Charges	$ per MWh	% of Total Charges	$ per MWh	% of Total Charges	$ per MWh	% of Total Charges	$ per MWh	% of Total Charges
Jan-12	$ 0.14	0.26%	$ 0.63	1.18%	$ 42.25	79.77%	$ 9.95	18.79%	$ 52.97	100.00%
Feb-12	$ 0.03	0.06%	$ 0.67	1.52%	$ 31.95	72.64%	$ 11.34	25.78%	$ 43.99	100.00%
Mar-12	$ 0.04	0.09%	$ 0.50	1.24%	$ 27.56	68.49%	$ 12.14	30.17%	$ 40.24	100.00%
Apr-12	$ 0.06	0.15%	$ 0.53	1.29%	$ 27.18	66.17%	$ 13.31	32.39%	$ 41.08	100.00%
May-12	$ 0.14	0.33%	$ 0.55	1.27%	$ 29.93	69.49%	$ 12.45	28.92%	$ 43.07	100.00%
Jun-12	$ 0.16	0.32%	$ 0.53	1.03%	$ 41.73	80.58%	$ 9.36	18.08%	$ 51.78	100.00%
Jul-12	$ 0.11	0.20%	$ 0.75	1.34%	$ 47.34	84.81%	$ 7.62	13.64%	$ 55.82	100.00%
Aug-12	$ 0.24	0.47%	$ 1.35	2.59%	$ 42.79	82.27%	$ 7.63	14.67%	$ 52.01	100.00%
Sep-12	$ 0.13	0.30%	$ 0.78	1.78%	$ 33.46	76.32%	$ 9.47	21.60%	$ 43.84	100.00%
Oct-12	$ 0.27	0.56%	$ 0.80	1.68%	$ 36.94	76.90%	$ 10.02	20.86%	$ 48.04	100.00%
Nov-12	$ 0.36	0.54%	$ 1.10	1.64%	$ 56.28	84.09%	$ 9.19	13.73%	$ 66.93	100.00%
Dec-12	$ 0.25	0.44%	$ 0.83	1.47%	$ 47.00	82.98%	$ 8.56	15.11%	$ 56.64	100.00%
Jan-13	$ 0.42	0.42%	$ 1.07	1.07%	$ 91.18	90.66%	$ 7.90	7.85%	$ 100.57	100.00%
Feb-13	$ 0.94	0.71%	$ 1.06	0.81%	$ 120.66	91.73%	$ 8.87	6.75%	$ 131.54	100.00%
Mar-13	$ 0.28	0.44%	$ 0.70	1.08%	$ 54.19	84.47%	$ 8.98	14.00%	$ 64.15	100.00%
Apr-13	$ 0.18	0.33%	$ 0.57	1.04%	$ 44.13	80.48%	$ 9.95	18.16%	$ 54.83	100.00%
May-13	$ 0.27	0.51%	$ 0.27	0.51%	$ 42.79	80.16%	$ 10.05	18.82%	$ 53.38	100.00%
Jun-13	$ 0.19	0.39%	$ 1.11	2.27%	$ 39.34	80.01%	$ 8.52	17.33%	$ 49.17	100.00%
Jul-13	$ 0.27	0.40%	$ 1.76	2.63%	$ 58.14	86.85%	$ 6.78	10.12%	$ 66.95	100.00%
Aug-13	$ 0.05	0.11%	$ 1.63	3.50%	$ 36.98	79.43%	$ 7.90	16.96%	$ 46.55	100.00%
Sep-13	$ 0.07	0.14%	$ 1.41	2.74%	$ 40.52	78.96%	$ 9.32	18.16%	$ 51.31	100.00%
Oct-13	$ 0.08	0.18%	$ 1.88	3.99%	$ 35.59	75.66%	$ 9.49	20.18%	$ 47.04	100.00%
Nov-13	$ 0.38	0.65%	$ 2.01	3.45%	$ 46.88	80.44%	$ 9.01	15.45%	$ 58.28	100.00%
Dec-13	$ 0.87	0.82%	$ 2.43	2.31%	$ 93.94	89.53%	$ 7.70	7.34%	$ 104.93	100.00%
Jan-14	$ 2.16	1.16%	$ 2.03	1.09%	$ 174.92	93.95%	$ 7.07	3.80%	$ 186.18	100.00%
Feb-14	$ 0.98	0.57%	$ 2.40	1.40%	$ 160.14	93.18%	$ 8.34	4.85%	$ 171.85	100.00%
Mar-14	$ 0.72	0.57%	$ 2.10	1.66%	$ 115.06	91.39%	$ 8.03	6.38%	$ 125.91	100.00%
Apr-14	$ 0.26	0.45%	$ 1.58	2.73%	$ 46.07	79.69%	$ 9.90	17.13%	$ 57.81	100.00%
May-14	$ 0.15	0.30%	$ 1.51	3.00%	$ 38.54	76.66%	$ 10.07	20.03%	$ 50.27	100.00%
Jun-14	$ 0.24	0.46%	$ 2.46	4.76%	$ 39.83	76.93%	$ 9.24	17.85%	$ 51.77	100.00%
. Average	$ 0.37	0.52%	$ 1.25	1.77%	$ 59.90	84.78%	$ 9.14	12.93%	$ 70.65	100.00%

Looking at uplift charges on a region-wide basis leads to similar conclusions. Table 2 below compares the total day-ahead and real-time economic NCPC with the average real-time Hub LMPs on a monthly basis from January 2012 through July 2014. Total economic uplift for the period, expressed on a $ per MWh of real-time load, was $0.76 per MWh and the average real-time LMP for the period was $54.51 per MWh. In other words, on region-wide basis total economic uplift charges was only 1.39% of the real-time energy rate.

Table 2

Breakdown of New England NCPC (Uplift) Charges

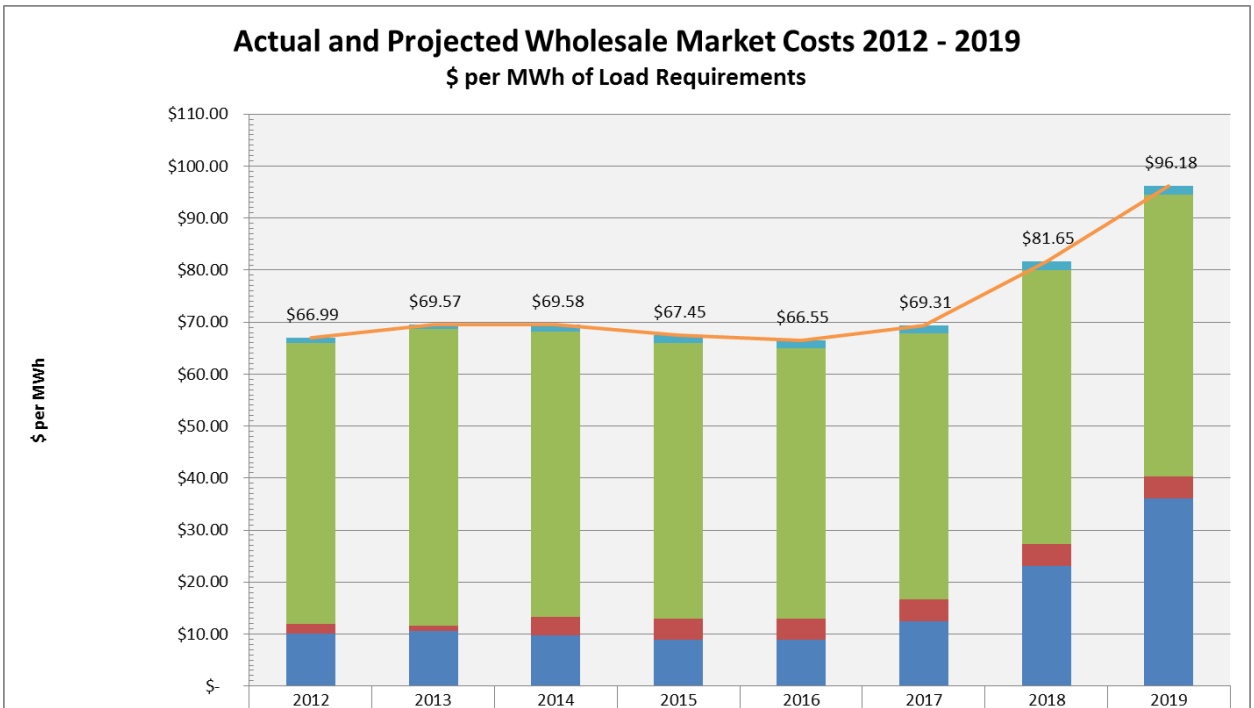
	New England Real-Time Load (MWh)	Total DA and RT Economic NCPC ($)	Total DA and RT Economic NCPC ($/MWh)	RT Hub LMP ($/MWh)	Economic NCPC as % of RT LMP
Jan-12	11,080,675	$ 4,078,827	$ 0.37	$37.10	0.99%
Feb-12	9,930,798	$ 555,948	$ 0.06	$30.14	0.19%
Mar-12	9,936,005	$ 2,219,638	$ 0.22	$25.39	0.88%
Apr-12	9,120,462	$ 2,950,908	$ 0.32	$25.41	1.27%
May-12	9,870,991	$ 4,013,718	$ 0.41	$27.99	1.45%
Jun-12	10,521,378	$ 8,363,737	$ 0.79	$33.83	2.35%
Jul-12	12,633,813	$ 7,883,062	$ 0.62	$41.94	1.49%
Aug-12	12,554,000	$ 3,537,397	$ 0.28	$42.79	0.66%
Sep-12	9,995,012	$ 1,844,474	$ 0.18	$33.59	0.55%
Oct-12	9,599,986	$ 6,128,470	$ 0.64	$34.65	1.84%
Nov-12	9,922,794	$ 10,572,236	$ 1.07	$56.36	1.89%
Dec-12	10,824,880	$ 5,102,931	$ 0.47	$43.63	1.08%
Jan-13	11,329,363	$ 18,992,549	$ 1.68	$84.17	1.99%
Feb-13	10,050,971	$ 22,540,999	$ 2.24	$108.25	2.07%
Mar-13	10,415,643	$ 5,497,644	$ 0.53	$54.01	0.98%
Apr-13	9,276,948	$ 2,127,614	$ 0.23	$42.69	0.54%
May-13	9,659,291	$ 3,157,773	$ 0.33	$38.46	0.85%
Jun-13	10,751,484	$ 4,753,410	$ 0.44	$39.49	1.12%
Jul-13	13,416,120	$ 10,020,752	$ 0.75	$57.12	1.31%
Aug-13	11,361,815	$ 1,165,707	$ 0.10	$35.08	0.29%
Sep-13	9,929,458	$ 1,026,129	$ 0.10	$36.26	0.29%
Oct-13	9,708,096	$ 1,599,304	$ 0.16	$35.92	0.46%
Nov-13	9,984,392	$ 4,047,686	$ 0.41	$45.85	0.88%
Dec-13	11,322,537	$ 14,993,031	$ 1.32	$98.54	1.34%
Jan-14	11,834,578	$ 67,550,051	$ 5.71	$162.88	3.50%
Feb-14	10,304,738	$ 11,394,002	$ 1.11	$152.84	0.72%
Mar-14	10,874,852	$ 12,066,479	$ 1.11	$116.05	0.96%
Apr-14	9,300,668	$ 2,978,579	$ 0.32	$41.20	0.78%
May-14	9,313,059	$ 2,126,399	$ 0.23	$35.46	0.64%
Jun-14	10,238,228	$ 2,848,292	$ 0.28	$37.92	0.73%
Jul-14	12,053,189	$ 2,288,978	$ 0.19	$34.91	0.54%
Total	327,116,224	$ 248,426,723	$ 0.76	$54.51	1.39%

Note that over this period, the NCPC charges allocated to CMEEC are substantially lower than the NCPC charges for the region as a whole ($0.37 per MWh vs. $0.76 per MWh). In New

England, real-time economic uplift charges are allocated based on the absolute value of the difference between day-ahead load obligations and actual real-time loads (i.e. load obligation deviations.) In order to minimize uplift charges, CMEEC has made significant efforts to enhance its day-ahead hourly load forecasting models in order to reduce these hourly load obligation deviations. Through these efforts, CMEEC has been able to minimize the amount of uplift allocated to its municipal electric utility members and customers.

Over the past several years, New England electric consumers have faced increasing wholesale market price volatility. While some of this is attributable the well documented volatility in the natural gas markets, electric consumers will be challenged going forward with substantial wholesale market cost increases associated with recent settled capacity market results, as well as additional market rule changes that have been approved by the Commission for implementation over the coming years. Figure 2 provides a breakdown of actual CMEEC wholesale market charges from January 2012 through June 2014 and projected costs through December 2019.

Figure 2



	2012	2013	2014	2015	2016	2017	2018	2019
ISO Tariff Cost	$0.99	$0.86	$1.45	$1.46	$1.51	$1.55	$1.59	$1.63
Energy Cost	$54.06	$57.11	$54.86	$53.08	$52.10	$51.10	$52.75	$54.18
Ancillary Services Cost	$1.92	$0.94	$3.52	$3.95	$4.05	$4.16	$4.26	$4.37
Capacity Cost	$10.01	$10.66	$9.75	$8.95	$8.89	$12.51	$23.05	$36.01
Total Wholesale Cost	$66.99	$69.57	$69.58	$67.45	$66.55	$69.31	$81.65	$96.18

Capacity Cost | Ancillary Services Cost | Energy Cost | ISO Tariff Cost | Total Wholesale Cost

While price formation issues in the energy and ancillary services markets are an important consideration in addressing the four foundational objectives for our industry, uplift represents a small fraction of overall wholesale market costs in New England. Uplift is primarily a problem for entities with a narrow commodity-based and transactional business model. Such entities claim uplift is a significant problem because they cannot "hedge" it bilaterally. By contrast, the business model employed by CMEEC (and public power systems in general) is more broadly focused on balancing reliability, cost to consumers, compensation to asset owners and policy and risk considerations on a long-term basis. As noted above, CMEEC has been able

to reduce and mitigate the impacts of uplift by improving the accuracy of our day-ahead load forecasting models, thereby reducing the amount of uplift allocated to our customers. From our perspective, we would caution against trying to solve the uplift "problem" by imposing even greater costs on consumers by artificially increasing energy and reserve market prices to a level beyond what they are already paying in uplift charges. We believe instead that there are options that the Commission can consider that will enhance reliability and address price formation concerns in the energy and ancillary service markets for the benefit of both electric consumers and asset owners that should also reduce uplift charges.

CAUSES OF UPLIFT

Uplift occurs primarily when the bulk power system operating needs and the security constrained commitment and dispatch models require resources to perform in ways that violate their stated physical operating limits. In these circumstances, ISO system operators often need to commit additional resources beyond what is committed in the normal day-ahead commitment and dispatch process in order to meet minimum operating reserve and replacement reserve requirements ("Supplemental Commitments".) In New England, these Supplemental Commitments are listed in the Morning Report (issued each morning at roughly 8:30 AM.) Looking at this Supplemental Commitment data for the period from January 1, 2012 through July 31, 2014 shows that ISO-NE made Supplemental Commitments roughly 29% of the time (270 days out of a total of 943 days in the period.) Real-time economic uplift charges on these days with Supplemental Commitments were $148,467,354, representing 82% of the total charges of $178,053,265 for the period. On days with Supplemental Commitments, the average DA LMP was $2.82 per MWh <u>less</u> than the RT LMP. Surprisingly, on all days without Supplemental Commitments, the average DA LMP was $1.71 per MWh <u>greater</u> than the RT

LMP. Finally, on days with Supplemental Commitments the DA load was 5.90% less than the actual RT load, while on all days without Supplemental Commitments the DA load was only 3.64% less than the RT load. These results are summarized on a monthly basis in Tables 3A, 3B, and 3C. Table 3A shows the results for all days in the period. Table 3B shows the results for only those days in which the ISO made Supplemental Commitments and Table 3C shows the results for only those days with no Supplemental Commitments.

Analysis of Supplemental Commitments, Load Bidding and LMP Prices on Uplift

			All Hours in Period										
	Days with Supplemental Commitment	Average MW Committed to Meet Min. Op. & Repl. Reserve Requirement	Total RT Economic NCPC Credits ($)	Total RT Economic NCPC Credits ($/MWh of RT Load)	% of RT Hub LMP	DA Hub LMP ($/MWh)	RT Hub LMP ($/MWh)	Hub LMP Spread ($/MWh)	DA Load (MWh)	RT Load (MWh)	Daily Load Deviation (MWh)	% of RT Load
Jan-12	10	754.30	$3,790,331.56	$ 0.34	0.92%	$40.59	$37.10	($3.49)	10,494,075.40	11,080,674.50	586,599.10	5.29%
Feb-12	2	160.00	$353,988.78	$ 0.04	0.12%	$30.92	$30.14	($0.77)	9,559,235.40	9,930,798.20	371,562.80	3.74%
Mar-12	7	669.29	$1,923,307.89	$ 0.19	0.76%	$26.15	$25.39	($0.76)	9,354,963.40	9,936,004.60	581,041.20	5.85%
Apr-12	7	743.00	$2,538,807.43	$ 0.28	1.10%	$25.88	$25.41	($0.47)	8,507,928.20	9,120,462.10	612,533.90	6.72%
May-12	5	774.80	$3,237,454.55	$ 0.33	1.17%	$25.88	$27.99	$2.11	9,133,679.70	9,870,990.80	737,311.10	7.47%
Jun-12	7	1,572.14	$7,504,031.20	$ 0.71	2.11%	$34.75	$33.83	($0.93)	9,819,583.80	10,521,377.70	701,793.90	6.67%
Jul-12	18	1,326.50	$7,537,994.94	$ 0.60	1.42%	$41.88	$41.94	$0.07	12,050,091.70	12,633,812.70	583,721.00	4.62%
Aug-12	18	1,008.56	$3,199,436.30	$ 0.25	0.60%	$38.53	$42.79	$4.26	12,019,784.40	12,553,999.70	534,215.30	4.26%
Sep-12	8	516.38	$1,149,217.32	$ 0.11	0.34%	$31.53	$33.59	$2.05	9,639,361.30	9,995,012.40	355,651.10	3.56%
Oct-12	18	616.61	$5,192,072.64	$ 0.54	1.56%	$35.27	$34.65	($0.62)	9,100,396.20	9,599,986.30	499,590.10	5.20%
Nov-12	22	1,022.14	$8,897,607.93	$ 0.90	1.59%	$54.98	$56.36	$1.39	9,327,698.80	9,922,794.30	595,095.50	6.00%
Dec-12	10	573.60	$3,173,230.19	$ 0.29	0.67%	$46.30	$43.63	($2.67)	10,321,071.20	10,824,879.90	503,808.70	4.65%
Jan-13	20	1,335.95	$17,715,492.17	$ 1.56	1.86%	$86.53	$84.17	($2.36)	10,714,337.00	11,329,363.30	615,026.30	5.43%
Feb-13	12	1,333.75	$17,773,812.73	$ 1.77	1.63%	$122.31	$108.25	($14.07)	9,505,623.50	10,050,970.90	545,347.40	5.43%
Mar-13	13	541.92	$3,525,352.75	$ 0.34	0.63%	$53.08	$54.01	$0.93	9,910,990.40	10,415,642.80	504,652.40	4.85%
Apr-13	3	464.00	$586,050.43	$ 0.06	0.15%	$42.89	$42.69	($0.19)	8,772,736.30	9,276,947.50	504,211.20	5.44%
May-13	3	622.67	$1,387,487.24	$ 0.14	0.37%	$40.31	$38.46	($1.84)	9,169,106.00	9,659,291.30	490,185.30	5.07%
Jun-13	7	1,403.43	$3,194,090.79	$ 0.30	0.75%	$37.09	$39.49	$2.40	10,169,320.60	10,751,484.30	582,163.70	5.41%
Jul-13	20	1,158.25	$8,758,811.12	$ 0.65	1.14%	$52.07	$57.12	$5.05	12,882,391.60	13,416,120.30	533,728.70	3.98%
Aug-13	4	553.25	$928,070.49	$ 0.08	0.23%	$34.71	$35.08	$0.36	11,162,513.00	11,361,814.60	199,301.60	1.75%
Sep-13	2	295.50	$553,318.60	$ 0.06	0.15%	$40.43	$36.26	($4.17)	9,686,575.10	9,929,458.20	242,883.10	2.45%
Oct-13	3	241.33	$972,948.71	$ 0.10	0.28%	$33.94	$35.92	$1.98	9,408,132.10	9,708,095.90	299,963.80	3.09%
Nov-13	5	429.60	$1,854,371.31	$ 0.19	0.41%	$45.22	$45.85	$0.63	9,627,772.10	9,984,392.20	356,620.10	3.57%
Dec-13	14	663.07	$7,248,992.15	$ 0.64	0.65%	$92.97	$98.54	$5.57	10,855,326.20	11,322,537.30	467,211.10	4.13%
Jan-14	17	1,424.82	$52,972,966.34	$ 4.48	2.75%	$168.81	$162.88	($5.93)	11,329,146.50	11,834,578.00	505,431.50	4.27%
Feb-14	2	173.00	$2,677,925.04	$ 0.26	0.17%	$156.02	$152.84	($3.18)	10,045,960.10	10,304,738.00	258,777.90	2.51%
Mar-14	3	796.33	$6,275,751.50	$ 0.58	0.50%	$111.16	$116.05	$4.89	10,528,512.50	10,874,851.60	346,339.10	3.18%
Apr-14	0	-	$540,048.73	$ 0.06	0.14%	$44.98	$41.20	($3.78)	9,076,363.20	9,300,667.60	224,304.40	2.41%
May-14	3	320.67	$658,942.14	$ 0.07	0.20%	$36.96	$35.46	($1.49)	8,953,931.20	9,313,059.30	359,128.10	3.86%
Jun-14	3	546.67	$1,154,762.46	$ 0.11	0.30%	$37.92	$37.92	($0.00)	9,927,035.60	10,238,228.20	311,192.60	3.04%
Jul-14	4	736.75	$776,589.64	$ 0.06	0.18%	$37.50	$34.91	($2.59)	11,872,976.60	12,053,189.20	180,212.60	1.50%
Total	270	931.83	$178,053,265.07	$ 0.54	1.00%	$55.08	$54.51	($0.57)	312,926,619.10	327,116,223.70	14,189,604.60	4.34%

Table 3A

Analysis of Supplemental Commitments, Load Bidding and LMP Prices on Uplift

Table 3B

			Only Days in Period With Supplemental Commitments									
	Days with Supplemental Commitment	Average MW Committed to Meet Min. Op. & Repl. Reserve Requirement	Total RT Economic NCPC Credits ($)	Total RT Economic NCPC Credits ($/MWh of RT Load)	% of RT Hub LMP	DA Hub LMP ($/MWh)	RT Hub LMP ($/MWh)	Hub LMP Spread ($/MWh)	DA Load (MWh)	RT Load (MWh)	Daily Load Deviation (MWh)	% of RT Load
Jan-12	10	754.30	$3,152,747.37	$ 0.86	1.91%	$49.88	$44.85	($5.03)	3,436,812.40	3,671,834.60	235,022.20	6.40%
Feb-12	2	160.00	$91,696.65	$ 0.13	0.36%	$38.61	$35.37	($3.24)	693,028.30	721,708.60	28,680.30	3.97%
Mar-12	7	669.29	$918,268.27	$ 0.40	1.46%	$30.64	$27.55	($3.09)	2,136,072.50	2,290,020.00	153,947.50	6.72%
Apr-12	7	743.00	$1,709,421.00	$ 0.78	2.71%	$28.93	$28.97	$0.04	1,985,223.60	2,179,441.50	194,217.90	8.91%
May-12	5	774.80	$643,083.76	$ 0.41	1.45%	$27.26	$27.91	$0.65	1,430,201.80	1,584,588.70	154,386.90	9.74%
Jun-12	7	1,572.14	$6,153,168.21	$ 2.11	3.44%	$62.18	$61.31	($0.87)	2,661,265.20	2,918,925.30	257,660.10	8.83%
Jul-12	18	1,326.50	$7,171,568.51	$ 0.93	2.02%	$46.73	$46.11	($0.62)	7,277,909.20	7,688,191.50	410,282.30	5.34%
Aug-12	18	1,008.56	$2,949,362.38	$ 0.38	0.75%	$41.38	$51.11	$9.73	7,215,122.30	7,667,780.70	452,658.40	5.90%
Sep-12	8	516.38	$727,207.77	$ 0.26	0.58%	$34.85	$44.48	$9.63	2,675,994.20	2,826,647.50	150,653.30	5.33%
Oct-12	18	616.61	$3,293,507.12	$ 0.60	1.66%	$35.92	$36.02	$0.09	5,141,036.90	5,497,578.70	356,541.80	6.49%
Nov-12	22	1,022.14	$7,906,972.21	$ 1.07	1.90%	$54.85	$56.57	$1.72	6,899,559.30	7,373,367.70	473,808.40	6.43%
Dec-12	10	573.60	$2,418,812.90	$ 0.68	1.40%	$52.41	$48.73	($3.68)	3,375,318.10	3,556,091.90	180,773.80	5.08%
Jan-13	20	1,335.95	$16,870,889.53	$ 2.26	2.13%	$106.06	$106.00	($0.06)	6,988,317.60	7,467,295.40	478,977.80	6.41%
Feb-13	12	1,333.75	$14,359,412.56	$ 3.26	2.25%	$165.20	$144.82	($20.38)	4,095,469.30	4,404,903.70	309,434.40	7.02%
Mar-13	13	541.92	$2,944,741.78	$ 0.65	1.04%	$56.39	$62.73	$6.33	4,241,241.90	4,511,009.70	269,767.80	5.98%
Apr-13	3	464.00	$193,285.08	$ 0.23	0.47%	$43.61	$48.06	$4.45	804,730.80	855,688.60	50,957.80	5.96%
May-13	3	622.67	$568,448.94	$ 0.53	1.16%	$47.21	$45.37	($1.83)	1,018,036.90	1,078,030.00	59,993.10	5.57%
Jun-13	7	1,403.43	$2,746,181.32	$ 0.96	1.79%	$44.34	$53.63	$9.29	2,604,452.40	2,855,551.00	251,098.60	8.79%
Jul-13	20	1,158.25	$8,426,349.63	$ 0.92	1.29%	$59.99	$71.22	$11.23	8,644,151.30	9,178,787.00	534,635.70	5.82%
Aug-13	4	553.25	$425,363.63	$ 0.27	0.62%	$39.11	$43.03	$3.92	1,528,299.50	1,584,422.70	56,123.20	3.54%
Sep-13	2	295.50	$210,706.82	$ 0.25	0.57%	$59.67	$44.58	($15.09)	798,637.30	831,046.00	32,408.70	3.90%
Oct-13	3	241.33	$111,951.73	$ 0.12	0.27%	$33.42	$45.60	$12.18	900,704.40	925,574.90	24,870.50	2.69%
Nov-13	5	429.60	$948,541.44	$ 0.58	0.73%	$52.07	$78.50	$26.43	1,560,034.60	1,649,431.90	89,397.30	5.42%
Dec-13	14	663.07	$6,056,141.35	$ 1.15	0.96%	$109.62	$120.60	$10.99	5,000,977.70	5,250,247.10	249,269.40	4.75%
Jan-14	17	1,424.82	$51,039,035.26	$ 7.63	3.80%	$212.37	$201.08	($11.29)	6,367,294.20	6,687,687.80	320,393.60	4.79%
Feb-14	2	173.00	$77,747.29	$ 0.11	0.06%	$185.09	$180.70	($4.39)	700,976.60	707,981.00	7,004.40	0.99%
Mar-14	3	796.33	$3,399,082.66	$ 3.12	1.56%	$155.36	$199.93	$44.56	1,063,889.20	1,089,787.00	25,897.80	2.38%
Apr-14	0	-	$0.00	$ -	0.00%	$0.00	$0.00	$0.00	-	-	0.00	0.00%
May-14	3	320.67	$222,945.93	$ 0.26	0.67%	$36.37	$38.25	$1.89	834,138.20	865,230.20	31,092.00	3.59%
Jun-14	3	546.67	$322,101.44	$ 0.28	0.57%	$42.55	$49.21	$6.66	1,081,587.10	1,140,443.30	58,856.20	5.16%
Jul-14	4	736.75	$408,611.37	$ 0.23	0.48%	$50.62	$47.94	($2.68)	1,704,207.10	1,757,460.10	53,253.00	3.03%
Total	270	931.83	$146,467,353.91	$ 1.45	2.15%	$64.60	$67.43	$2.82	94,864,689.90	100,816,754.10	5,952,064.20	5.90%

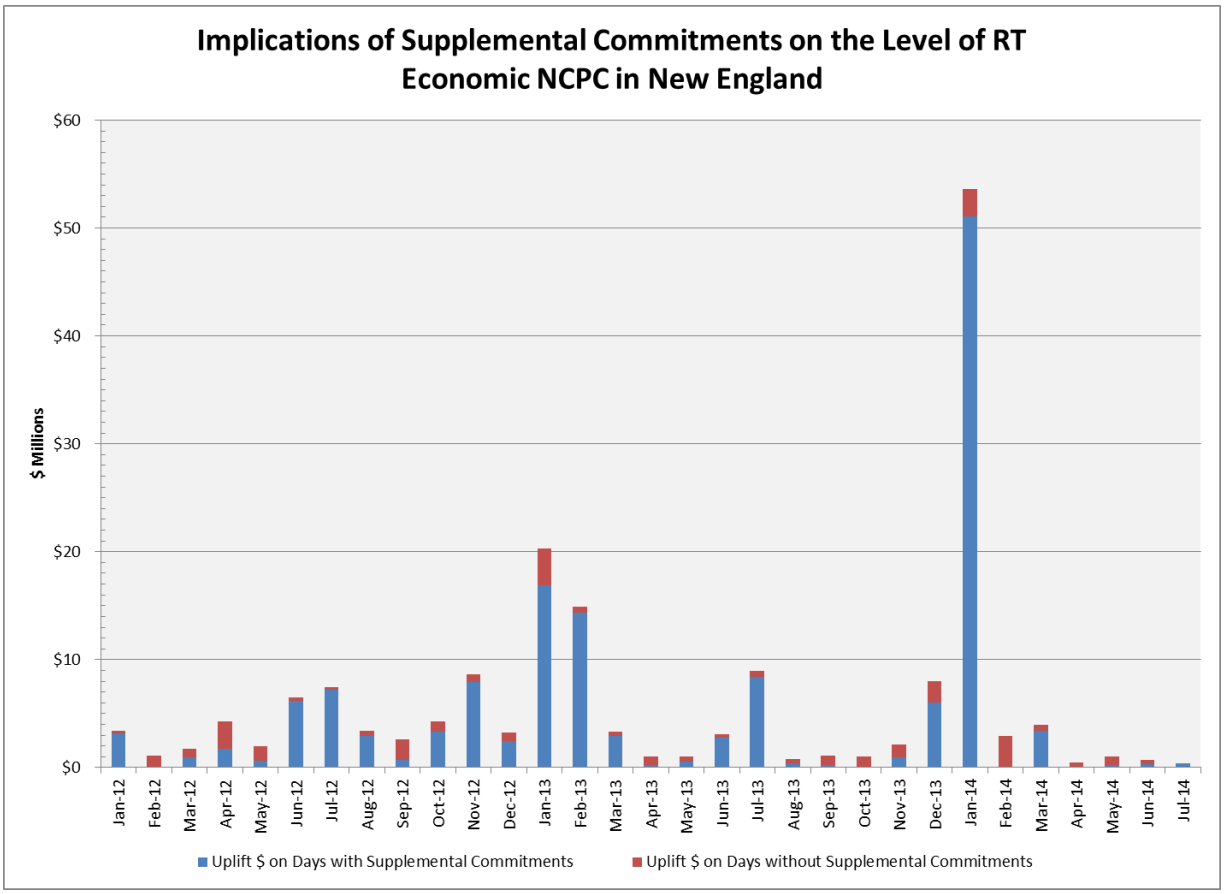
Analysis of Supplemental Commitments, Load Bidding and LMP Prices on Uplift

			Days Without Supplemental Commitments									
	Days with Supplemental Commitment	Average MW Committed to Meet Min. Op. & Repl. Reserve Requirement	Total RT Economic NCPC Credits ($)	Total RT Economic NCPC Credits ($/MWh of RT Load)	% of RT Hub LMP	DA Hub LMP ($/MWh)	RT Hub LMP ($/MWh)	Hub LMP Spread ($/MWh)	DA Load (MWh)	RT Load (MWh)	Daily Load Deviation (MWh)	% of RT Load
Jan-12	-	-	$637,584.19	$0.09	0.26%	$36.16	$33.40	($2.76)	7,057,263.00	7,408,839.90	351,576.90	4.75%
Feb-12	-	-	$262,292.13	$0.03	0.10%	$30.35	$29.76	($0.59)	8,866,207.10	9,209,089.60	342,882.50	3.72%
Mar-12	-	-	$1,005,039.62	$0.13	0.53%	$24.85	$24.76	($0.08)	7,218,890.90	7,645,984.60	427,093.70	5.59%
Apr-12	-	-	$829,386.43	$0.12	0.49%	$24.95	$24.33	($0.62)	6,522,704.60	6,941,020.60	418,316.00	6.03%
May-12	-	-	$2,594,370.79	$0.31	1.12%	$25.61	$28.01	$2.40	7,703,477.90	8,286,402.10	582,924.20	7.03%
Jun-12	-	-	$1,350,862.99	$0.18	0.70%	$26.41	$25.46	($0.95)	7,158,318.60	7,602,452.40	444,133.80	5.84%
Jul-12	-	-	$366,426.43	$0.07	0.20%	$35.17	$36.18	$1.01	4,772,182.50	4,945,621.20	173,438.70	3.51%
Aug-12	-	-	$250,073.92	$0.05	0.16%	$34.58	$31.28	($3.31)	4,804,662.10	4,886,219.00	81,556.90	1.67%
Sep-12	-	-	$422,009.55	$0.06	0.20%	$30.33	$29.63	($0.70)	6,963,367.10	7,168,364.90	204,997.80	2.86%
Oct-12	-	-	$1,898,565.52	$0.46	1.41%	$34.37	$32.77	($1.61)	3,959,359.30	4,102,407.60	143,048.30	3.49%
Nov-12	-	-	$990,635.72	$0.39	0.70%	$55.33	$55.80	$0.48	2,428,139.50	2,549,426.60	121,287.10	4.76%
Dec-12	-	-	$754,417.29	$0.10	0.25%	$43.39	$41.20	($2.20)	6,945,753.10	7,268,788.00	323,034.90	4.44%
Jan-13	-	-	$844,602.64	$0.22	0.49%	$51.02	$44.48	($6.54)	3,726,019.40	3,862,067.90	136,048.50	3.52%
Feb-13	-	-	$3,414,400.17	$0.60	0.75%	$90.15	$80.81	($9.33)	5,410,154.20	5,646,067.20	235,913.00	4.18%
Mar-13	-	-	$580,610.97	$0.10	0.21%	$50.69	$47.71	($2.98)	5,669,748.50	5,904,633.10	234,884.60	3.98%
Apr-13	-	-	$392,765.35	$0.05	0.11%	$42.81	$42.09	($0.71)	7,968,005.50	8,421,258.90	453,253.40	5.38%
May-13	-	-	$819,038.30	$0.10	0.25%	$39.57	$37.72	($1.84)	8,151,069.10	8,581,261.30	430,192.20	5.01%
Jun-13	-	-	$447,909.47	$0.06	0.16%	$34.88	$35.18	$0.30	7,564,868.20	7,895,933.30	331,065.10	4.19%
Jul-13	-	-	$332,461.49	$0.08	0.25%	$37.67	$31.49	($6.17)	4,238,240.30	4,237,333.30	(907.00)	-0.02%
Aug-13	-	-	$502,706.86	$0.05	0.15%	$34.06	$33.90	($0.17)	9,634,213.50	9,777,391.90	143,178.40	1.46%
Sep-13	-	-	$342,611.78	$0.04	0.11%	$39.05	$35.66	($3.39)	8,887,937.80	9,098,412.20	210,474.40	2.31%
Oct-13	-	-	$860,996.98	$0.10	0.28%	$33.99	$34.88	$0.88	8,507,427.70	8,782,521.00	275,093.30	3.13%
Nov-13	-	-	$905,829.87	$0.11	0.28%	$43.85	$39.32	($4.53)	8,067,737.50	8,334,960.30	267,222.80	3.21%
Dec-13	-	-	$1,192,850.80	$0.20	0.24%	$79.25	$80.36	$1.11	5,854,348.50	6,072,290.20	217,941.70	3.59%
Jan-14	-	-	$1,933,931.08	$0.38	0.32%	$115.92	$116.49	$0.57	4,961,852.30	5,146,890.20	185,037.90	3.60%
Feb-14	-	-	$2,600,177.75	$0.27	0.18%	$153.79	$150.70	($3.08)	9,344,983.50	9,596,757.00	251,773.50	2.62%
Mar-14	-	-	$2,876,668.84	$0.29	0.27%	$106.42	$107.06	$0.64	9,464,623.30	9,785,064.60	320,441.30	3.27%
Apr-14	-	-	$540,048.73	$0.06	0.14%	$44.98	$41.20	($3.78)	9,076,363.20	9,300,667.60	224,304.40	2.41%
May-14	-	-	$435,996.21	$0.05	0.15%	$37.02	$35.17	($1.85)	8,119,793.00	8,447,829.10	328,036.10	3.88%
Jun-14	-	-	$832,661.02	$0.09	0.25%	$37.40	$36.66	($0.74)	8,845,448.50	9,097,784.90	252,336.40	2.77%
Jul-14	-	-	$367,978.27	$0.04	0.11%	$35.55	$32.97	($2.58)	10,168,769.50	10,295,729.10	126,959.60	1.23%
Total	-	-	$31,585,911.16	$0.14	0.30%	$48.70	$46.98	($1.71)	218,061,929.20	226,299,469.60	8,237,540.40	3.64%

Table 3C

Figure 1 below shows a monthly breakdown between total uplift charges on days with Supplemental Commitments during the month and total uplift charges on days without Supplemental Commitments during the month. Clearly, the level of uplift is highly correlated with Supplemental Commitments by the ISO.

Figure 3



Observations and Conclusions

The most obvious conclusion from this analysis is that there is a strong correlation between the level of real-time economic uplift in New England and the level of supplemental commitments made by the ISO to meet operating reserve and replacement reserve requirements. The best way for the Commission to address concerns over uplift, without unduly affecting

reliability or prices in the energy and reserve markets, would be to assure that commitment schedule developed as part of the day-ahead market settlement reflects, as closely as possible, the conditions that the system operators will face in real time. We have already started down this path in New England by incorporating an incremental replacement reserve requirement in the DA commitment process and enhancing zonal constraint modeling in the day-ahead commitment process. Further work still needs to be done in terms of allocating day-ahead and real-time NCPC charges and improving how we model and price the impact of reserve constraints in the day-ahead dispatch software.

One option we would not support, at least until all options to enhance the day-ahead commitment process have been implemented, would be efforts to artificially increase energy market prices for the sole purpose of mitigating uplift. While this might make it easier for entities with short-term transactional and commodity business models, this would be detrimental to electric consumers in general and, we believe, would upset the balance between reliability, cost to consumers, compensation to asset owners and policy and risk objectives.

CMEEC respectfully requests the Commission to consider the foregoing comments, and to take affirmative steps as suggested above to revamp and improve RTO-administered wholesale market mechanisms to better meet the needs of market participants and electric consumers.

Respectfully submitted,

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE

/s/ Brian Forshaw

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