



State of Rhode Island and Providence Plantations

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PUBLIC UTILITIES COMMISSION

Patrick C. Lynch, Attorney General

June 10, 2010

Luly Massaro, Clerk
Public Utilities Commission
89 Jefferson Blvd.
Warwick, RI 02888

Re: Docket No. 4149

Dear Ms. Massaro,

As discussed enclosed please find a hard copy of the Division's Response to National Grid's Second Set of Data Request, and the accompanying attachments:

1. Division Response to NG 2-17; and
2. Division Response to NG 2-18.

Very truly yours,

Leo J. Wold

Assistant Attorney General

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DOCKET No. 4149

**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
Set 2**

NG 2-1: Page 3, lines 8-10 of the Testimony of Richard S. Hahn state, "For the Residential Customer group, the Company should utilize Block Products instead of the Full Requirements Service contracts proposed by NGRID. This procurement method will result in lower, more stable SOS rates on average over time."

- a. Please explain how Mr. Hahn's proposed procurement approach, which involves using spot market purchases and sales to true up deviations between his proposed block purchase quantities and the uncertain actual load quantities, will result in "more stable" SOS rates over time than the Company's proposed procurement approach, in which the block products and spot market true-up purchases and sales are replaced by full requirements products that involve an all-in fixed price for load-following service.
- b. Does Mr. Hahn agree that a fixed-price full requirements contract for 100 percent of the load in calendar year 2011 would provide more stable SOS rates on average over time than a block contract for 100 percent of the expected load in calendar year 2011? If not, then please explain your answer.

Response:

- a. The true-up involves both buying spot market energy when block purchases are lower than actual hourly loads and selling spot market energy when block purchases are higher than actual hourly loads result in offsetting purchases and sales. This causes rates to be very stable, as shown in the graph on page 4 of Mr. Hahn's testimony.
- b. Please see the response to part a. above.

Prepared by: Richard S. Hahn

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NG 2-2: Page 3, lines 11-12 of the Testimony of Richard S. Hahn state, "As shown in the following chart, Block Products are a very effective hedge against unanticipated increase or decreases in market prices and the level of SOS loads." Does Mr. Hahn believe that block products are a more effective hedge than a fixed-price full requirements contract against unanticipated increases and decreases in market prices and the level of SOS loads? If so, then please explain your answer.

Response: Yes, especially given that the expected value SOS rate using block products is lower than for full requirements service contracts, as the Company has admitted in its testimony and exhibits. Please refer to the response to NG 2-1.

Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
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NG 2-3: Page 3, lines 13-15 of the Testimony of Richard S. Hahn state, "Block Products are also effective in avoiding large over or under-recoveries under a wide range of outcomes, and they represent a reasonable, cost-effective hedge against price and load volatility." Does Mr. Hahn believe that block products are more effective in avoiding large over and under-recoveries than a fixed-price full requirements contract? If so, then please explain your answer.

Response: Mr. Hahn believes that block products are effective in managing over and under-collections, especially considering that the Company has proposed using full requirements service contracts for 90% of the SOS load and spot purchases for 10% of the SOS load. Using the examples in my testimony, the inclusion of the 10% spot purchases results in over / under collections that range from \$8 million over-collection to an \$11 million under-collection. With block products, under-collections range from zero to \$15 million at the extremes of the outcomes analyzed. If the Company's proposal for reconciliations every six months is used, as opposed to yearly, the differentials between costs and revenues will decrease under both methods. The expected value savings with block products is \$12 million per year.

Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
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NG 2-4: Page 3, lines 13-15 of the Testimony of Richard S. Hahn state with regard to residential SOS procurement, "Block Products are also effective in avoiding large over or under-recoveries under a wide range of outcomes, and they represent a reasonable, cost-effective hedge against price and load volatility," and this text is immediately followed on the top of page 4 with a graphic in which scenarios are portrayed that involve load changes of up to 15% and price changes of up to 50%. Furthermore, page 27, lines 13-14 state with regard to residential SOS procurement, "A wide range of outcomes, from a 50% price decrease with a 15% load decrease to a 50% price increase with a 15% load increase, was analyzed." Please provide all studies, work papers, electronic files (with formulas intact), assumptions, and calculations that were utilized to determine that load changes of up to 15% and price changes of up to 50% represent a "wide range of outcomes."

Response: The following table provides annual load-weighted and simple average Locational Marginal Prices ("LMPs") for the Rhode Island load zone in the ISO-NE control area since 2003. In 2005, the 44% increase was caused by Hurricane Katrina. In 2009, the 48% decrease was caused by a severe recession. The range of +/-50% exceeded all of the historical price variations. The actual hourly loads and LMPs are available from the ISO-NE web site.

demand weighted				
year	average LMP	% chg	Average LMP	% chg
2003	\$49.84		\$48.11	
2004	\$54.88	10%	\$52.82	10%
2005	\$79.19	44%	\$76.19	44%
2006	\$61.70	-22%	\$59.09	-22%
2007	\$68.69	11%	\$66.16	12%
2008	\$82.72	20%	\$79.26	20%
2009	\$42.82	-48%	\$41.15	-48%
	\$62.83	3%	\$60.40	3%

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Data available from the Commission web site indicated that residential customer switching rates in Rhode Island have been very small, virtually zero, indicating a very low probability of switching. The +/-15% was analyzed to assess the effects of a high level of load variability.

Prepared by: Richard S. Hahn

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NG 2-5: Page 11 of the Testimony of Richard S. Hahn describes Mr. Hahn's proposal for the Industrial Group. Under this proposal, would revenues be fully trued up to National Grid's actual procurement costs?

Response: Yes.

Prepared by: Richard S. Hahn

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NG 2-6: Page 12, line 6 of the Testimony of Richard S. Hahn states that "any increase in switching potential is likely to be small."

- a. What is the basis for this claim?
- b. Please provide any studies or analysis used to make this determination.

Response: The basis for this claim is that industrial customers already have a high tendency to switch to competitive suppliers. Since both procurement methods have prices that change monthly, that tendency is unlikely to change substantially. No formal studies or analyses were used in making this determination.

Prepared by: Richard S. Hahn

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NG 2-7: Page 13, lines 3-4 of the Testimony of Richard S. Hahn state, "For [the Commercial Group] at this time in Rhode Island, I believe that the use of FRS contracts is acceptable." Please explain why, in Mr. Hahn's opinion, the use of FRS contracts is acceptable for the Commercial Group.

Response: Mr. Hahn's testimony and analyses focused on the residential customer group. Because this customer class is least likely to switch, it is important to procure SOS power supplies at low, stable costs. Because he has not focused on the commercial customer group, Mr. Hahn accepts the Company's proposal for this class at this time. However, it is certainly possible that block products should also be used to procure power supplies for the commercial customer group in the future.

Prepared by: Richard S. Hahn

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NG 2-8: Page 15, lines 18-19 of the Testimony of Richard S. Hahn state, "Using a combination of peak and off-peak blocks, purchases can be designed to effectively serve any load shape." Could a combination of peak and off-peak block products alone be used to hedge price and load risk on *all* customer load, given that customer load is uncertain and varies from hour to hour? Please explain your answer.

Response: Mr. Hahn's analysis of block products is focused on residential customer loads, not all customer loads. However, a combination of peak and off-peak block products could be used to hedge price and volume risk for any customer loads. The basis for his belief that block products are an effective hedge against price and volume risk is thoroughly explained in his testimony.

Prepared by: Richard S. Hahn

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NG 2-9: Page 15, lines 18-19 of the Testimony of Richard S. Hahn state, "Using a combination of peak and off-peak blocks, purchases can be designed to effectively serve any load shape." Furthermore, page 16, lines 2-6 state, "When the hourly load is above the amount of blocks purchased, incremental spot purchases are made. When the hourly load is below the amount of blocks purchased, incremental spot sales are made. The size of Block Products can be designed to minimize or even eliminate the net cost of these incremental purchases and sales."

- a. Do these statements apply to some expected load shape or do the same statements apply to any load shape that may actually occur in the future? Please explain your answer.
- b. Do these statements apply equally to any point in time in the future? For example, would Mr. Hahn make the same statement with respect to "any load shape" for next month or three years from now? Please explain your answer.

Response:

- a. The design of the size of the block products is done against some expected load shape or set of hourly loads. As actual hourly loads vary from the expected shape in the future, the expected level of incremental buying and selling will change from the expected level. The analysis provided in Mr. Hahn's testimony shows that the net cost of this incremental buying and selling is small relative to overall cost of SOS power supplies and does not significantly affect the affect the actual SOS rate paid after true-up.
- b. The Company has proposed using contracts with terms ranging from six to 24 months. The referenced statement would apply over this range of time; the price and volume variability would be expected to remain with the ranges analyzed in Mr. Hahn's testimony. As the layering and laddering of contracts is implemented, the block sizes can be adjusted in each procurement to reflect known changes in SOS loads.

Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
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NG 2-10: Page 16, lines 2-6 of the Testimony of Richard S. Hahn state, "When the hourly load is above the amount of blocks purchased, incremental spot purchases are made. When the hourly load is below the amount of blocks purchased, incremental spot sales are made. The size of Block Products can be designed to minimize or even eliminate the net cost of these incremental purchases and sales."

- a. Is Mr. Hahn aware of any instance in which a block product *eliminated* the net cost of incremental purchases and sales associated with residential customer load throughout the period of the block product?
- b. If the answer to (a) is yes, please identify and describe all such instances, and please provide all studies, supporting work papers, electronic files (with formulas intact), assumptions, and calculations to support your answer.

Response: For given hourly loads and hourly spot market prices, block products can be designed to eliminate net purchases and sales. Block product purchases are typically made in rounded amounts (*i.e.*, 400 MW instead of 398.31743 MW). Exhibit RSH-2 illustrates this design process with rounded block sizes, which eliminates all but 0.1% of the net cost of purchases and sales. Attached to this response is a version of Exhibit RSH-2 but without rounded block sizes. The net cost of purchases and sales is zero, and the design of the block size has eliminated all of this net cost.

Prepared by: Richard S. Hahn

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Attachment to the Response to NG 2-10
Same as Exhibit RSH-2 But Without Rounded Block sizes

MONTHLY PEAK AND OFFPEAK BLOCK SIZES
Scenario A with 0 % price change and 0 % load change

month	Block Size		Avg Load		Total MWH Load		MWH Purch / (Sale)		\$ Purch / (Sale)	
	peak	offpeak	peak	offpeak	peak	offpeak	peak	offpeak	peak	offpeak
1	398,31743	351,46070	385	337	135,595	132,127	(4,613)	(5,646)	(10,259)	\$0
2	397,40292	355,90413	392	344	131,749	123,706	(1,778)	(4,420)	(6,198)	\$0
3	340,35079	322,73063	338	312	113,443	127,227	(915)	(4,447)	(5,362)	\$0
4	295,37665	267,93277	296	259	104,188	95,385	215	(3,214)	(2,999)	\$0
5	285,83705	260,69457	288	253	96,796	103,093	755	(3,271)	(2,516)	\$0
6	411,60286	357,57682	394	336	132,533	128,206	(5,765)	(8,103)	(13,869)	\$0
7	554,86073	434,55537	541	414	190,431	162,268	(4,880)	(8,078)	(12,958)	\$0
8	417,71767	358,41868	413	344	138,656	140,477	(1,697)	(5,758)	(7,455)	\$0
9	338,59480	307,40117	336	295	113,020	113,335	(745)	(4,707)	(5,452)	\$0
10	332,81032	281,29405	330	273	121,474	102,495	(1,000)	(3,256)	(4,256)	\$0
11	357,73923	315,48457	354	305	107,531	126,767	(1,221)	(4,475)	(5,696)	\$0
12	413,84660	352,62056	403	335	141,991	131,496	(3,683)	(6,731)	(10,414)	\$0
			1,527,406	1,487,583	3,014,988		(25,329)	(62,105)	(87,434)	\$0
							-2.8%	percent of total block purchases		0.0%

Net Purchase / (Sale) Summary

Purchases	110,997	151,054	262,051	\$8,871,049	\$9,923,461	\$18,794,510
\$/MWH				\$79.92	\$65.69	\$71.77
Sales	(136,326)	(213,159)	(349,484)	(\$8,871,049)	(\$9,923,461)	(\$18,794,510)
\$/MWH				\$65.07	\$46.55	\$53.78
net	(25,329)	(62,105)	(87,434)	\$0	(\$0)	\$0
\$/MWH				\$0.00	\$0.00	(\$0.00)

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
Set 2**

NG 2-11: Page 18, lines 8-9 of the Testimony of Richard S. Hahn state, "...Block Products are equal, if not superior to, FRS contracts at hedging price and volume risk for residential customers."

- a. If National Grid were to purchase a fixed-price full requirements contract for 100 percent of the actual residential load, what is Mr. Hahn's understanding of who bears the price and volume risk for residential customers during the contract period?
- b. If National Grid were to purchase block product contract(s) for 100 percent of the expected residential load, what is Mr. Hahn's understanding of who bears the price and volume risk for residential customers during the contract period?

Response: If NGRID used full requirements contracts to serve 100% of its residential SOS load, then the full requirements suppliers bear the risk of changes in price and volume. However, according to the Company's own analysis, residential customers would pay on average approximately \$4 per MWH more than if block blocks were used. Residential load in Rhode Island is approximately 3 million MWH per year. If SOS rates are \$4 per MWH higher than they need to be, that translates into a \$12 million increase in rates.

If NGRID used block products to serve 100% of its residential SOS load, then the customers bear the risk of changes in price and volume. However, as shown in my testimony, the cost of accepting those risks is less than the higher premium paid for full requirements contracts over a wide range of price and volume changes.

It should be noted that the Company has proposed using a mix of 90% full requirements contracts and 10% spot purchases for the residential customer group. The customers will bear the price and volume risk associated with the 10% spot purchases. The inclusion of 10% spot purchases will introduce similar levels of price and volume risk than will utilization of block products. Therefore, the Company has already deemed this level of risk to be reasonable for residential customers.

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Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
Set 2**

NG 2-12: Page 18, lines 8-9 of the Testimony of Richard S. Hahn state, "...Block Products are equal, if not superior to, FRS contracts at hedging price and volume risk for residential customers." Is it Mr. Hahn's belief that Block Products are of equal or of superior effectiveness (as compared to fixed-price full requirements contracts) at protecting residential customers from price and volume risks, or is it Mr. Hahn's belief that Block Products (plus the incremental day-ahead and/or real-time market purchases and sales necessary to meet actual load requirements) are less expensive than fixed-price full requirements contracts and that while fixed-price full requirements contracts are superior to Block Products at protecting residential customers from price and volume risks, the added cost is not worth the added benefit? Please explain your answer.

Response: Please refer to the response to NG 2-11.

Prepared by: Richard S. Hahn

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NG 2-13: Referring to page 20, Figure 3 of the Testimony of Richard S. Hahn, would Mr. Hahn agree that the supply cost surprise is more volatile under a Managed Portfolio approach than under a Full Requirements approach? If not, then please explain your answer.

Response: Figure 3 on page 20 is an excerpt for NGRID Exhibit 1, which is the Northbridge analysis. Since the detailed workings of this model have not been made available, Mr. Hahn is unable to agree or disagree that the supply cost surprise is more volatile under a Managed Portfolio approach than under a Full Requirements approach.

Prepared by: Richard S. Hahn

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NG 2-14: Page 28, lines 21-22 of the Testimony of Richard S. Hahn state with regard to residential SOS procurement, "At price changes in excess of -30% and load changes of -15%, FRS contracts do yield lower SOS rates, but these are at the extremes of the outcomes analyzed." Furthermore, page 33, lines 3-4 state, "The situations where FRS contracts did result in lower SOS rates occurred at the extremes of the range of plausible outcomes." Please provide all studies, work papers, electronic files (with formulas intact), assumptions, and calculations that were utilized to determine that price changes in excess of -30% and load changes of -15% are "at the extremes of the range of plausible outcomes."

Response: Please refer to the response to NG 2-4.

Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
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NG 2-15: Page 30, lines 8-10 of the Testimony of Richard S. Hahn state with regard to Mr. Hahn's proposed block product procurement method for National Grid's Residential Group SOS supply, "...Exhibits RSH-7 and RSH-8, which assesses the performance of the three procurement methods against price and volume volatility, shows a maximum over or under recovery of approximately \$1 million."

- a. Does Mr. Hahn believe that over or under recoveries of over \$1 million are plausible under his proposed block product procurement method?
- b. If the answer to (a) is yes, then what does Mr. Hahn believe is not accounted for in Exhibits RSH-7 and RSH-8 which could lead to over or under recoveries that are greater than the "maximum" value of approximately \$1 million shown in RSH-7 and RSH-8?

Response:

- a. Yes. It should also be noted that the Company's proposal to use 10% spot purchases and 90% full requirements contracts could also result in over or under collections in excess of \$1.0 million.
- b. The over or under recoveries identified in Exhibits RSH-7 and RSH-8 are accurate for the assumptions made in preparing these exhibits. Exhibit RSH-7 examines changes in price only. With properly designed block products, MWH purchases when loads are above the block size are approximately equal to MWH sales when loads are below the block size. Since both purchases and sales are assumed to be made at hourly spot prices, the net cost changes only slightly, and the over or under recovery is very small (i.e., approximately +/- \$0.1 million or less). Similarly, Exhibit RSH-8 examines only changes in volume. As volume declines, there are more sales and less purchases, but the year-end over or under collection does not exceed approximately \$1.0 million, which is small relative to total SOS costs ranging from \$169 million to \$227 million. As shown in Exhibits RSH-9 and RSH-10, combinations of changes in prices and loads can result in over or under collections that are greater than \$1 million.

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NG 2-16: Page 30, line 15 of the Testimony of Richard S. Hahn refers to the "extremes of the outcomes analyzed."

- a. Please provide any studies, analysis, and data relied upon by Mr. Hahn to determine what the appropriate "extremes" to analyze were.
- b. Does Mr. Hahn believe that the "extremes of the outcomes analyzed" reflect all plausible outcomes? Please explain your answer.

Response: Please refer to the response to NG 2-4.

Prepared by: Richard S. Hahn

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NG 2-17: The following question pertains to the Testimony of Richard S. Hahn. Please provide any filed public reports, testimony, and other documents produced by Mr. Hahn in public proceedings in the last five years that evaluate the FRS and managed portfolio approaches to SOS procurement.

Response: Please refer to the attached electronic file named "4149 Division Response to NG 2-17.zip" for copies of the requested documents.

Prepared by: Richard S. Hahn

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NG 2-18: Page 2, lines 18-22 of the Testimony of Richard S. Hahn state, "La Capra Associates, Inc. ('La Capra Associates') has been retained by the Division to review and comment on NGRID's plan to procure SOS power supplies for 2011 and to comply with Renewable Energy Standards ('RES') for 2011, including the Northbridge study that compared various procurement methodologies. This testimony presents the results of that review, and my conclusions and recommendations." Please provide any filed public reports, testimony, and other documents produced by La Capra Associates in public proceedings in the last five years that evaluate the FRS and managed portfolio approaches to SOS procurement.

Response: Please refer to the attached electronic file named "4149 Division Response to NG 2-18.zip" for copies of the requested documents.

Prepared by: Richard S. Hahn

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NG 2-19: Please provide all of the underlying data used, in electronic form (including hourly load and price data, and the identification of the hour to which each data point pertains), and the sources of the data, to develop Exhibits RSH-2, RSH-3, RSH-4, RSH-5, RSH-6, RSH-7, RSH-8, RSH-9, RSH-10, RSH-11, RSH-12, and RSH-13 of the Testimony of Richard S. Hahn.

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Response: Please refer to the confidential response to NG 1-1.

Prepared by: Richard S. Hahn

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NG 2-20: The following questions pertain to the analysis depicted in Exhibits RSH-2, RSH-3, RSH-4, RSH-5, RSH-6, RSH-7, RSH-8, RSH-9, RSH-10, RSH-11, RSH-12, and RSH-13 of the Testimony of Richard S. Hahn.

- a. For the block purchases that are assumed to be made as part of this analysis, what is the delivery point pertaining to the block purchases?
- b. For the spot market purchases and sales that are assumed to be made as part of this analysis, what is the delivery point pertaining to the spot market purchases and sales?

Response: The delivery point for all SOS procurements in these exhibits is the Rhode Island load zone of the ISO-NE control area.

Prepared by: Richard S. Hahn

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NG 2-21: The following question pertain to the analysis depicted in Exhibits RSH-2, RSH-3, RSH-4, RSH-5, RSH-6, RSH-7, RSH-8, RSH-9, RSH-10, RSH-11, RSH-12, and RSH-13 of the Testimony of Richard S. Hahn. For the block purchases that are assumed to be made as part of this analysis, are the block purchases assumed to be made through NYMEX or through an RFP?

Response: The block products were assumed to be made through an RFP to competitive suppliers.

Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
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NG 2-22: Please provide, in electronic or hardcopy form, the source code of all macros used to develop Exhibits RSH-2, RSH-3, RSH-4, RSH-5, RSH-6, RSH-7, RSH-8, RSH-9, RSH-10, RSH-11, RSH-12, and RSH-13 of the Testimony of Richard S. Hahn.

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Response: The source code for the macros in Mr. Hahn's model represents commercially valuable information developed by La Capra Associates. The following descriptions should allow NGRID to understand what these macros do.

Calc1: This macro determines the monthly peak and off-peak block sizes that will yield a zero cost of net peak and off-peak purchases and sales each month. These block sizes are subsequently rounded off to the nearest 5 MW.

Calc2: This macro determines the yearly fixed SOS rate at the beginning of the year assuming 100% spot market purchases that will result an expected over or under recovery of zero.

Calc3: This macro determines the yearly fixed SOS rate at the beginning of the year assuming 100% block product purchases that will result an expected over or under recovery including interest of zero.

Calc4: This macro determines the peak and off-peak block sizes that will yield zero net peak and off-peak purchases and sales for a sample daily load shape. This is used to illustrate how block sizes can be established, but is not used in any of Mr. Hahn's exhibits.

Prepared by: Richard S. Hahn

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NG 2-23: Page 22, line 22 and page 23, lines 1-3 of the Testimony of Richard S. Hahn state, "I used NYMEX peak and off-peak Block Product futures prices for each calendar month for 2009 as they settled on December 30, 2008. Hourly spot prices were assumed to be 2008 RI zone LMPs scaled down to result on a spot market prices that was \$2 to \$3 per MWH lower than Block Products, which is consistent with the Northbridge base case model."

- a. Please provide the "NYMEX peak and off-peak Block Product futures prices for each calendar month for 2009 as they settled on December 30, 2008" that were used.
- b. What delivery location pertains to the "NYMEX peak and off-peak Block Product futures prices" that were used?
- c. Were the prices for the block purchases assumed to be made in the analysis equal to the "NYMEX peak and off-peak Block Product futures prices"? If not, then please identify the dollar per MWH amounts of any differences, and please describe the derivation and rationale for any differences.
- d. Do the assumed hourly spot prices include any adjustment for any locational basis differential between the delivery location pertaining to the "NYMEX peak and off-peak Block Product futures prices" and the Rhode Island Load Zone? If so, then please identify the dollar per MWH amount of any adjustment, please describe the calculation of the adjustment, and please provide a sample calculation of the adjustment.
- e. Please provide the hourly spot prices (including the identification of the hour to which each price pertains) that resulted after the 2008 RI zone LMPs were "scaled down to result on a spot market prices that was \$2 to \$3 per MWH lower than Block Products."

Response:

- a. Please refer to the confidential response to NG 1-1.
- b. NYMEX futures prices assume that the delivery point is the ISO-NE Hub.

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- c. No. To arrive at the assumed block product prices, the NYMEX futures prices were decreased by 2% to account for price differentials between the ISO-NE Hub and the Rhode Island load zone. The 2% differential is based upon historic LMPs from 2003 to 2009. The resulting prices were increased by 3% to include premiums charged by competitive suppliers selling block products in response to an RFP.
- d. Hourly spot prices were for the Rhode Island load zone.
- e. Please refer to the confidential response to NG 1-1.

Prepared by: Richard S. Hahn

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NG 2-24: Page 22, line 22 and page 23, lines 1-3 of the Testimony of Richard S. Hahn state, "I used NYMEX peak and off-peak Block Product futures prices for each calendar month for 2009 as they settled on December 30, 2008. Hourly spot prices were assumed to be 2008 RI zone LMPs scaled down to result on a spot market prices that was \$2 to \$3 per MWH lower than Block Products, which is consistent with the Northbridge base case model." Please provide the calculations (with all formulae intact) that converted the "2008 RI zone LMPs" to the assumed "hourly spot prices" described in this statement.

Response: Each actual hourly spot price for the Rhode Island load zone for 2008 was multiplied by 0.76 to arrive at the forecast of hourly prices used in Mr. Hahn's analysis. The hourly spot prices used are provided in the confidential response to NG 1-1.

Prepared by: Richard S. Hahn

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NG 2-25: Page 23, lines 10-13 of the Testimony of Richard S. Hahn state, "The peak and off-peak block sizes for each month were established so that the monthly sum of the cost of hourly purchases when load exceeded the block amount approximately equaled the monthly sum of revenues from hourly sales when loads were less than the block amount. Block sizes were rounded to the nearest 5 MW."

- a. Was the calculation, to make the cost of hourly purchases when load exceeded the block amount approximately equal to the sum of revenues when hourly sales were less than the block amount, performed for each monthly peak or off-peak period separately (e.g., an approximate equivalence was calculated over January on-peak hours, and an approximate equivalence was separately calculated over July off-peak hours)?
- b. If the answer to (a) is no, then over what time period(s) was the approximate equivalence calculated?

Response: Yes.

Prepared by: Richard S. Hahn

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NG 2-26: Please provide the calculation (with all formulae intact) of the 400 MW January peak block size shown in Exhibit RSH-2 of the Testimony of Richard S. Hahn, including the derivations (with all formulae intact) of the -5,205 MW value for January peak "MWH Purch / (Sale)" and the (\$42,765) value for January peak "\$ Purch / (Sale)".

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Response: The requested calculations are provided in the confidential response to NG 1-1.

Prepared by: Richard S. Hahn

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**The Division of Public Utilities and Carriers Responses to National Grid's Data Requests
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NG 2-27: Please provide the calculation (with all formulae intact) of the (\$1,426,923) January "Spot Costs" shown in Exhibit RSH-5 of the Testimony of Richard S. Hahn.

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Response: The requested calculations are provided in the confidential response to NG 1-1.

Prepared by: Richard S. Hahn

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NG 2-28: In Exhibits RSH-5, RSH-6, RSH-7, RSH-8, RSH-9, RSH-10, RSH-11, RSH-12, and RSH-13 of the Testimony of Richard S. Hahn, scenarios are analyzed in which prices are changed by quoted assumed percentages, and/or loads are changed by quoted assumed percentages.

- a. In any given one of these scenarios, is the same percentage price change applied to *every* hourly price used in the analysis?
- b. In any given one of these scenarios, is the same percentage load change applied to *every* hourly load used in the analysis?

Response: Yes to both parts. These assumptions were made to simplify the model and test the extreme values of price and volume volatility.

Prepared by: Richard S. Hahn