Thomas R. Teehan
Senior Counsel

June 3, 2010

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02889

RE: 2011 Standard Offer Service Procurement Plan
2011 Renewable Energy Standard Procurement Plan
Docket No. 4149

Dear Ms. Massaro:

On behalf of National Grid [1] I have enclosed ten copies of the rebuttal testimony of Margaret Janzen, Jeanne Lloyd, and Scott Fisher of The NorthBridge Group.

Thank you for your attention to this transmittal. If you have any questions, please feel free to contact me at (401) 784-7667.

Very truly yours,

Thomas R. Teehan

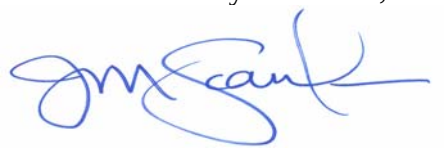
Enclosure

cc: Leo Wold, Esq.
Steve Scialabba, Division

[1] The Narragansett Electric Company d/b/a National Grid ("National Grid" or the "Company")

Certificate of Service

I hereby certify that a copy of the cover letter and/or any materials accompanying this certificate were electronically submitted, hand delivered and mailed to the individuals listed below.



Joanne M. Scanlon
National Grid

June 3, 2010
Date

Docket No. 4149 National Grid – 2011 SOS and RES Procurement Plans
Service List updated 5/3/10

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REBUTTAL TESTIMONY

OF

MARGARET M. JANZEN

JUNE 3, 2010

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I. Introduction

Q. Please state your name and business address.

A. My name is Margaret M. Janzen, and my business address is 100 East Old Country Road, Hicksville, NY 11801.

Q. Have you previously filed testimony in this proceeding?

A. Yes, in this docket.

II. Purpose of Rebuttal Testimony

Q. What is the purpose of your rebuttal testimony?

A. The Company would like to take this opportunity to respond to certain recommendations regarding the Company's proposed SOS procurement plan for 2011 addressed in both the direct testimony of Richard Hahn filed on behalf of the Rhode Island Division of Public Utilities and Carriers ("Division"), as well as the direct testimony of Daniel Allegretti filed on behalf of Constellation.

III. Response to the Division

Q. What does Mr. Hahn recommend with regards to the Company's proposed full requirements service ("FRS") contracts for the Residential Group?

A. Mr. Hahn recommends that the Company should utilize block products instead of full requirements contracts for the Residential Group.

Q. What is your response to Mr. Hahn's recommendation to use block products instead of full requirements contracts?

A. The Company is convinced that full requirements contracts are superior to block products in terms of the value added for price and volatility management. The difference in expected rates is small with respect to the added benefits from a fixed-price, load-following, bundled product. Full requirements contracts are more effective in protecting Standard Offer customers against the costs and risks associated with all aspects of customer supply requirements. In full requirements contracts, these risks are borne by the suppliers at a fixed price. The difference between block products and full requirements contracts has been analyzed quantitatively by The NorthBridge Group ("NorthBridge"), as presented in the Company's January 22, 2010 compliance filing. The NorthBridge analysis and its conclusions are described in detail in the rebuttal testimony of Scott Fisher.

Q. What is Mr. Hahn's recommendation with regards to the procurement plan for the Industrial Group?

A. Mr. Hahn recommends that the Company transition the Industrial Group to a procurement plan based upon 100% spot purchases.

Q. What is your response to Mr. Hahn's recommendation of 100% spot purchases for the Industrial Group?

A. The Company shares Mr. Hahn's view regarding 100% spot purchases for the Industrial

Group and plans to move in that direction as part of its long term electric procurement strategy. However, the development of hourly pricing suggested by Mr. Hahn will take a considerable period of time, in order to properly implement the technical changes as well as customer outreach and education. In addition to the changes in metering equipment, software upgrades and billing system changes would most likely be necessary. The Company is planning to further analyze the implementation issues and investment requirements, and is willing to prepare a report on its findings for the Commission by March 1, 2011. The Company will work with interested parties on the development of hourly pricing and transitioning for periods beyond 2011.

Please refer to the rebuttal testimony by Jeanne Lloyd for further response to Mr. Hahn's recommendation on rates for the Industrial Group.

Q. What are Mr. Hahn's statements with regards to the transition procurement plans to a steady state plan for the Commercial and Residential Groups?

A. Mr. Hahn states that the transition plans are "lengthy" due to the Company's desire to have the plans coincident with the calendar year, which is based on a competitive supplier survey.

Q. What is your response to Mr. Hahn's statements on the transition procurement plans and the supplier survey?

A. I would like to clarify how the Company used the results of the supplier survey in the

development of the proposed SOS procurement plans. Overall, the Company's proposed procurement plans seek competitive pricing while managing volatility and risks for Standard Offer customers. To that end, the Company conducted a confidential survey of competitive suppliers to seek valuable market information on the most efficient method to structure full requirements transactions that deliver full value to Standard Offer customers. The Company concluded from the survey responses that efficient pricing for full requirements transactions was achieved in the form of transactions based on the calendar year[1] and in sizes of approximately 50 MW. Thus this survey information was important in developing Standard Offer procurement plans with efficient transaction pricing. In summary, Standard Offer customers would be the ultimate beneficiaries of the information gleaned from the supplier survey.

Q. Would the Company be able to shorten the transition period if it utilized transactions not based on the calendar year?

A. Yes, the Company could shorten the transition period if it utilized other transactions not based on the calendar year, but this may not result in the best value for customers since they would forgo the potential benefits of calendar year-based contracts.

Q. What is Mr. Hahn's statement about the use of full requirements contracts for the Commercial Group?

A. Mr. Hahn states that the use of full requirements contracts is acceptable for the

[1] Calendar-based transactions include six to 24 month transactions that begin in either the month of January or July.

Commercial Group.

Q. What rationale does Mr. Hahn provide for his statement that full requirements contracts are acceptable for the Commercial Group?

A. Mr. Hahn does not explain why full requirements contracts are acceptable for the Commercial Group.

Q. What are Mr. Hahn's comments about Schedule MMJ-6 as referenced on page 35 of his direct testimony?

A. Mr. Hahn commented that the language should be removed that refers to the comparison of lowest final bids to National Grid's estimate of expected bids.

Q. What is your response to Mr. Hahn's comment to remove this language from Schedule MMJ-6?

A. The Company would like to clarify that it does not intend to use its estimate of expected bids as a means to determine that all bids received were excessive and should be rejected. This pricing point is only for the purpose of the RFP Summary, for the benefit of the Division and the Commission. To be clear, the lowest price will determine the winning bidders. This statement can be added to the RFP Summary document to help clarify that point.

IV. Response to Constellation

Q. What does Mr. Allegretti recommend with regards to spot market purchases from the

Independent System Operator-New England ("ISO-NE")?

A. Mr. Allegretti recommends that spot market purchases not be included in the proposed 2011 procurement plan.

Q. What is your response to Mr. Allegretti's recommendation to exclude spot market purchases?

A. The component of spot market purchases was introduced into the Standard Offer procurement plan by the Commission in its Order in Docket 4041, and the Company believes that it adds value to the Standard Offer supply portfolio for a few reasons. The direct involvement and representation of the Company in the energy markets for the Rhode Island load zone within the ISO-NE is in the best interest of all Standard Offer customers. Maintaining a core competency of market expertise allows the Company to expeditiously execute its contingency plan in the case of a FRS supplier default, since it would already be participating in the day ahead market on a daily basis. As a result, in the event of a default, the exposure to the real time balancing market would be mitigated through the Company's day ahead market participation. Also, the Company has proposed a level of spot market purchases for the Residential and Commercial Groups that is not a major component within the procurement plan. The majority of the procurement plan provides stable pricing through several layered full requirements transactions.

Q. What is Mr. Allegretti's statement on small customers' choice of supply?

A. Mr. Allegretti states that Standard Offer Service should be "plain-vanilla" and not include spot purchases, since customers can leave Standard Offer Service to choose another option from a competitive retail supplier.

Q. What is your response to Mr. Allegretti's contention that SOS should be "plain-vanilla" and not include spot purchases?

A. The inclusion of 10% spot purchases is not likely to affect the ability of mass market customers to seek other supply options from competitive suppliers to the extent they are available. In summary, the Company's proposal of a combination of spot market purchases and full requirements contracts provides a balanced supply portfolio for mass market Standard Offer customers.

V. Conclusion

Q. Does this conclude your rebuttal testimony?

A. Yes. It does.

REBUTTAL TESTIMONY

OF

JEANNE A. LLOYD

JUNE 3, 2010

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I. Introduction

Q. Please state your full name and business address.

A. My name is Jeanne A. Lloyd, and my business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. Have you previously filed testimony in this proceeding?

A. Yes, I have.

II. Purpose of Testimony

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to address certain recommendations regarding the Company's proposed SOS procurement plan for 2011 raised by Division witness Richard S. Hahn in his direct testimony filed in this proceeding. Specifically, I will address Mr. Hahn's recommendations that 1) customers in the proposed Commercial Group be allowed to switch between fixed and variable pricing once a year and 2) Standard Offer supply for the Industrial Group be procured through 100% spot market purchases and priced on an hourly basis.

III. Commercial Group Ability to Switch Between Pricing Options

Q. What is the Company's position regarding Mr. Hahn's recommendation that Commercial Group customers be allowed to switch between fixed and variable pricing once a year?

A. The Company does not oppose Mr. Hahn's recommendation to allow customers in this group to switch once a year between fixed and variable pricing. However, the Company proposes that switching between pricing options be allowed only at the beginning of a pricing period.

Q. Please describe in detail how this process would be implemented.

A. For customers in the Commercial Group, the Company will designate the variable price option as the "customary" pricing option. This means that, upon implementation of the change in the SOS pricing structure for this group on January 1, 2012, all existing customers will be assigned the variable price option, but given the chance to opt out of this assignment. Thereafter, all customers who remain on variable pricing will have the opportunity once, during 2012, to switch to the fixed price option effective July 1, 2012 or January 1, 2013, coincident with the beginning of the pricing period. Thereafter, during a customer's uninterrupted stay on SOS, a customer must remain on the selected pricing option for twelve months before switching to the alternative pricing option, coincident with beginning of the next pricing period.

Q. How will customers be in the Commercial Group be notified of the availability of the two pricing options and their ability to choose an option?

A. As stated in my March 1, 2010, testimony on this matter, prior to implementation, the Company will conduct an outreach effort for customers in this group to inform them of

changes to SOS, the pricing options available to them, and procedures for switching between options. The Company will post information on the National Grid/Narragansett Electric website explaining the switching process and will also include the same information in bill inserts and/or bill messages to all new customers and to existing customers at least once a year. If existing customers in the Commercial Group wish to elect to switch to the fixed price option before implementation of the pricing structure for this group, the customers may do so and the Company will classify the customer accordingly.

Q. Please describe the options available to new SOS customers.

A. New SOS customers can go down two paths with regard to the new pricing structure. On the first path, the Company will place the customer on the customary variable price option. However, such customer will have the option to switch to the fixed price option effective at the beginning of any following pricing period. Once the customer selects a different pricing option (in this scenario, the fixed price option), that customer must remain on the selected pricing option for twelve months before switching to the alternative pricing option.

On the second path, the customer can select the fixed price option at the time service is initiated. The customer must remain on fixed pricing throughout the following twelve

months and would then be eligible to transfer to variable pricing effective at the beginning of the following pricing period after the first twelve months of SOS service.

In either case, once a customer makes an election to switch to the alternative pricing option, the customer must remain on that pricing option, regardless of whether it is fixed or variable, for twelve months.

Q. How will a customer notify the Company that they wish to switch between pricing options?

A. A customer may initiate a switch between pricing options simply by calling a customer service representative prior to the issuance of the customer's January or July service bill.[1]

Q. Why does the Company propose to allow switching only at the beginning of pricing period?

A. Switching from one pricing option to another may result in an over or under collection of costs if the switching occurs during the middle of a pricing period. Allowing switching between pricing options to occur only at the beginning of a pricing period will mitigate those potential deferrals. In addition, limiting switching to only the beginning of a pricing period will make this process simpler and more efficient to administer.

[1] The Company has proposed that, beginning January 2012, Residential and Small Commercial class prices change twice per year, on January 1 and July 1.

IV. Spot Market Purchases for the Industrial Group

Q. What is Mr. Hahn's recommendation regarding the procurement of SOS and pricing for the Industrial Group?

A. Mr. Hahn's recommendation is that the Company procure SOS supply for the Industrial Group through 100% spot market purchases and offer hourly prices.

Q. What is the Company's response to this proposal?

A. As indicated in the rebuttal testimony of Ms. Janzen, the Company is not opposed to spot market procurements and mandatory hourly pricing for this group. However, the Company does have some concerns regarding the implementation of hourly pricing for the customers in this group and does not recommend, at this time, a specific transition period to mandatory hourly pricing.

Q. Please describe the Company's concerns regarding the implementation of hourly pricing for the Industrial Group.

A. First, implementing hourly pricing for this group will require investment in computer systems and metering equipment. In order to obtain the required billing determinants, each customer must have appropriate metering in place. Although all of the customers receiving service on Rates B-32, G-32, B-62 and G-62 currently have some form of interval data recorder (meters capable of recording hourly usage) installed, it is likely that not all of the customers have the type of meter that would be necessary for full

implementation of hourly pricing. In addition, the Company's meter data services systems and billing and information systems will need to be modified in order to meter and bill customers on an hourly basis.

Second, as of May 2010, approximately 50% of the customers taking service on Rates B/G-32 and B/G-62, representing approximately 65% of the kWh deliveries of those classes, have left SOS to take commodity service from competitive suppliers. The average monthly use per customer for all customers taking service from competitive suppliers is approximately 260,000 kWh. For customers receiving SOS, use per customer is approximately 135,000 kWh per month. Thus, customers remaining on SOS tend to be, on average, much smaller than customers who choose to take service from competitive suppliers. These smaller customers may not be as well suited as larger customers to effectively manage their electric usage in the manner that would be required under hourly pricing. The Company believes that more detailed analysis of the customers remaining on SOS is necessary in order to more definitively conclude whether or not smaller Industrial customers will need additional education, outreach or energy management tools to effectively manage their usage and avoid potential adverse impacts of a sudden switch to hourly pricing.

Q. In Docket No. 4041, the Company proposed to investigate the possibility of implementing a time-of-use (TOU) pilot program during 2010. What is the status of this investigation?

A. The Company has delayed the planning of a TOU pilot program for two reasons. First, during 2009, the Company submitted its application for American Reinvestment and Recovery Act ("ARRA") matching funds for the purpose of implementing a Smart Grid pilot. The Company's intention was to integrate an hourly pricing program as part of the Smart Grid pilot. The Commission suspended this docket pending the results of the Company's application for ARRA funding. However, during late 2009, the Company learned that it would not receive any ARRA funds. The Company does not anticipate that in the near future it will pursue its plan for a Rhode Island Smart Grid pilot.

Second, during 2009, the Company saw an increase in large customer migration to the competitive market. In March 2009, approximately 60% of the customers in the proposed Industrial Group, representing approximately 50% of the kWh deliveries, were receiving SOS. As indicated above, currently, approximately 50% of the customers, representing 35% of the load, remain on SOS. Since any pilot program would necessarily require participating customers to take SOS during the duration of the pilot, the increase in migration activity makes the design of a pilot program increasingly difficult.

Q. What is the Company's proposal in this proceeding?

A. The Company is proposing to evaluate the metering and information systems that would be necessary to install in order to offer hourly pricing to every customer in the Industrial Group. In addition, the Company will investigate whether hourly pricing should be mandatory for the entire Industrial class, or whether it would be more appropriate to establish a usage threshold above which hourly pricing would be mandatory, and whether additional outreach and tools would be effective in transitioning the entire class to hourly pricing. The results of the Company's investigation will be submitted to the Commission as part of the Company's March 1, 2011 Standard Offer Procurement Plan filing. Included in that report will be the Company's recommendation regarding the implementation of hourly pricing and the recommended timeline for implementation.

V. Conclusion

Q. Does this conclude your testimony?

A. Yes.

REBUTTAL TESTIMONY

OF

SCOTT G. FISHER

JUNE 3, 2010

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a. Mr. Hahn makes an unfair "apples" to "oranges" comparison between a "base case" block procurement approach in a world with no load and price uncertainty and a full requirements procurement approach that reflects pricing in a world with load and price uncertainty. 6

b. While Mr. Hahn presents a lot of figures and numbers in his exhibits to support his "base case," his "base case" value boils down to a reliance on, and misapplication of, hand-picked values from the NorthBridge Study. 13

c. Mr. Hahn also provides no empirical basis upon which to assess the expected SOS rates or costs of his recommended block procurement approach, because he provides no justification for the "what if" scenarios he has selected and no quantification of (or basis for quantifying) their likelihoods of occurring. 15

d. In addition, Mr. Hahn fails to fully represent the extent of the true costs and risks associated with the block procurement approach, because i) he misinterprets and/or misapplies the values that he found in and relies upon from the NorthBridge Study, ii) he fails to consider the range of possible future scenarios (and important dynamics pertaining to price and load uncertainty) that is supported by real-world evidence in electricity markets, and iii) he overlooks important cost and/or risk components of a block procurement approach. 17

IV. In contrast, the NorthBridge Study is a robust analysis that captures the complexity and uncertainty of electric markets, and reflects actual market information about costs and risks. 39

V. Mr. Hahn's qualitative comparison of his recommended block procurement approach to an insurance policy with a deductible is inaccurate because the block procurement approach fails to adequately hedge risks for customers when customers most need insurance (i.e., when market outcomes deviate significantly from expectations). 42

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I. Introduction

Q. Please state your name and business address.

A. My name is Scott G. Fisher, and my business address is 30 Monument Square, Suite 105, Concord, Massachusetts 01742.

Q. What is your current position?

A. I am a Principal with The NorthBridge Group ("NorthBridge"), an economic and strategic consulting firm serving the electric and natural gas industries.

Q. On whose behalf are you submitting testimony?

A. I am submitting testimony on behalf of National Grid.

Q. Please summarize your professional and academic background.

A. Since joining NorthBridge in 1998, I have advised companies in the electric industry on decisions related to risk management, asset valuation and portfolio management, product pricing, contract negotiations, regulatory affairs, supply procurement, rate design, and overall corporate strategy. Before joining NorthBridge, I was a consultant at Strategic Decisions Group, a management consulting firm serving a variety of industries. I received an A.B. from Dartmouth College, and a B.E. from the Thayer School of Engineering at Dartmouth College, with high honors. In addition, I received an M.S. in

Engineering-Economic Systems from Stanford University and an M.B.A. from the Tuck School of Business at Dartmouth College, with high honors.

II. Purpose of Testimony

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond to Rhode Island Division of Public Utilities and Carriers ("Division") witness Richard S. Hahn's claims regarding the costs and risks of using full requirements products versus using block products to serve standard offer service ("SOS") customers, including his comments regarding a study performed by The NorthBridge Group ("NorthBridge Study")[1] of the relative costs and risks of different approaches to serve mass market SOS customers, and his "simpler spreadsheet model that attempted to assess the performance of these procurement methods."[2]

Q. Please summarize your major conclusions.

A. My major conclusions are:

1. Mr. Hahn's analysis contains serious flaws and should not be relied upon to reach any conclusions with regard to the relative attractiveness of different procurement approaches. This conclusion is supported by the following points:

[1] "Analysis of Standard Offer Service Approaches for Mass Market Customers," by The NorthBridge Group, attached as Exhibit A to National Grid's Report Regarding Its Comprehensive Review of Standard Offer Service Procurement Strategies filed in Rhode Island Public Utilities Commission Docket 4041.
[2] Direct Testimony of Richard S. Hahn, at 21, lines 6-7.

a) Mr. Hahn makes an unfair "apples" to "oranges" comparison between a "base case" block procurement approach in a world with no load and price uncertainty and a full requirements procurement approach that reflects pricing in a world with load and price uncertainty. In other words, his "base case" relies upon an assumption that future loads and prices will match expectations, but that the prices for full requirements products that he relies upon still include compensation to cover the risks, and the costs associated with these risks, that exist in the real and uncertain world.

b) While Mr. Hahn presents a lot of figures and numbers in his exhibits to support his "base case," his "base case" value boils down to a reliance on, and misapplication of, hand-picked values from the NorthBridge Study. In fact, his "base case" analysis could be replaced by simply multiplying $3.92 per MWH (a figure that he derives from values that he found in the NorthBridge Study) by his estimate of residential SOS load (3 million MWH) to arrive at his estimated $11.8 million cost difference, when comparing a full requirements price that includes compensation for costs and risks associated with real-world market uncertainty to a block procurement approach in an unrealistic world with no risks. Therefore, his "base case" provides no meaningful information on which to base a decision about the costs and benefits of insuring against market risks.

c) Mr. Hahn also provides no empirical basis upon which to assess the "expected"[3] SOS rates or costs of his recommended block procurement approach, because he provides no justification for the "what if" scenarios he has selected and no quantification of (or basis for quantifying) their likelihoods of occurring.

d) In addition, Mr. Hahn fails to fully represent the extent of the true costs and risks associated with the block procurement approach, because i) he misinterprets and/or misapplies the values that he found in and relies upon from the NorthBridge Study, ii) he fails to consider the range of possible future scenarios (and important dynamics pertaining to price and load uncertainty) that is supported by real-world evidence in electricity markets, and iii) he overlooks important cost and/or risk components of a block procurement approach.

2. In contrast, the NorthBridge Study is a robust analysis that captures the complexity and uncertainty of electric markets, and reflects actual market information about costs and risks. As shown on page 15 of the NorthBridge Study, the difference in the expected SOS rate under the representative full requirements product procurement approach versus under the representative block product procurement approach is calculated to be only $0.72 per MWH,[4] or about

[3] The "expected" value, when used in this context, refers to the probability-weighted average value, considering all possible scenarios.
[4] NorthBridge Study, at 15.

$2.2 million if applied to the SOS load that Mr. Hahn evaluates. This figure is much less than the $11.8 million figure that Mr. Hahn claims is the difference in his "base case." Based on the NorthBridge Study, this $2.2 million estimated cost would allow ratepayers to avoid supply cost surprise of $19 million and potential cost deferrals of $39 million.[5]

3. Mr. Hahn's qualitative comparison of his recommended block procurement approach to an insurance policy with a deductible is inaccurate because the block procurement approach fails to adequately hedge risks for customers when customers most need insurance (i.e., when market outcomes deviate significantly from expectations).

The remainder of my testimony supports these conclusions.

III. Mr. Hahn's analysis contains serious flaws and should not be relied upon to reach any conclusions with regard to the relative attractiveness of different procurement approaches.

Q. Have you been provided the calculations of the numbers in Mr. Hahn's analysis?

A. No. The Division has not provided the calculations as of the time of the development of this testimony. While Mr. Hahn asserts that all of the calculations and assumptions in his

[5] The figures quoted here are expressed in terms of the difference, between the representative full requirements product procurement approach and the representative block product procurement approach, in the averages of the top 10% of the scenarios modeled, and are scaled to reflect the assumed three million MWH of residential load.

model can be seen and understood,[6] he has cited proprietary and competitive concerns about divulging this information in discovery.[7] However, Mr. Hahn's testimony contains descriptions of some of his assumptions and his approach, which allow me to evaluate his analysis. I reserve the right to supplement this testimony as appropriate upon reviewing any requested information that is subsequently provided.

a. Mr. Hahn makes an unfair "apples" to "oranges" comparison between a "base case" block procurement approach in a world with no load and price uncertainty and a full requirements procurement approach that reflects pricing in a world with load and price uncertainty.

Q. Please explain how fixed-price full requirements products, like those that National Grid has proposed to procure, provide price stability and protect customers from costs and risks driven by future scenarios that deviate from expectations.

A. A fixed-price full requirements product obligates the seller of the product to satisfy a specified percentage of all of the SOS customers' supply requirements in every hour of the delivery period, regardless of the SOS customers' changes in energy consumption, and regardless of the extent to which customers switch to or from SOS. The seller of the fixed-price full requirements product is paid a predetermined price per megawatt-hour for this service regardless of what future market prices turn out to be, and the seller is

[6] Direct Testimony of Richard S. Hahn, at 21, lines 7-9.
[7] Objection of the Division of Public Utilities and Carriers to the First Data Request of the Narragansett Electric Company, D/B/A National Grid, at 1.

responsible for assuming, managing, and covering the financial costs and risks associated with electricity supply while customers are provided the associated price stability and protection against adverse market outcomes. Sellers of fixed-price full requirements products must satisfy their obligation, regardless of how much market prices may increase during the delivery period and regardless of the SOS load level. Yet if market prices decrease after the supply contracts are signed, then customers may elect service from a lower cost competitive retail supplier without affecting the price of the SOS supply contracted under the fixed-price full requirements products. Effectively, the fixed-price full requirements product price acts as a cap on rates (for the load covered by the fixed-price full requirements products), because the product price for SOS supply is guaranteed, but customers can switch to competitive retail suppliers if they can find a better deal.[8] Furthermore, under the Company's plan, bidders compete on the basis of the lowest price to provide the fixed-price full requirements product, and customers' rates are based on the lowest bid prices for the fixed-price full requirements products.[9]

Q. Does Mr. Hahn universally oppose using fixed-price full requirements products to supply SOS customers?

[8] This is not true under the block procurement approach advocated by Mr. Hahn because under this approach customers (through the utility) commit to fixed quantities of supply at fixed prices, and must still incur the associated above-market costs on the entire contracted quantities if market prices drop and customers switch to competitive retail suppliers.

[9] With the exception of the portion of supply that is procured through spot market-priced purchases.

A. No. Mr. Hahn states that he believes that the use of fixed-price full requirements products to supply SOS customers in the Commercial Group is acceptable at this time.[10] However, he opposes the use of fixed-price full requirements products to supply SOS customers in the Residential Group, and instead proposes that these customers be supplied using a block procurement approach.

Q. Would adopting Mr. Hahn's recommended block procurement approach provide the same protections for customers against unexpected costs and risks?

A. No, Mr. Hahn's approach would expose residential customers to greater risks than a fixed-price full requirements procurement approach would.

Q. Please explain.

A. The block procurement approach does not make the financial risks associated with SOS supply costs disappear. Instead, these risks exist regardless of the procurement approach that is chosen. But, the choice of procurement approach affects who will bear these risks. Under a block procurement approach, SOS costs for customers can be unstable because financial risks associated with SOS supply are retained by the customer, and it is the customer that ultimately bears the burden of unexpected swings in cost and load. For example:

- Customers would bear increased risks due to uncertainty regarding usage and

[10] Direct Testimony of Richard S. Hahn, at 13, lines 3-4.

price levels. This uncertainty could be driven by unexpected weather patterns, changes in customer usage patterns, plant outages or transmission line outages, fuel price shocks, unexpected economic growth levels, and unanticipated ancillary services costs.

- Furthermore, the general positive correlation between loads and prices (e.g., a heat wave drives up both prices and loads) compounds the potential costs associated with this uncertainty.
- In addition, if the block products are for delivery at a location that is different than where the power is needed, then customers assume "basis risk," which is due to the mismatch between where the power is supplied and where it is needed.
- SOS customers would also bear financial costs and risks associated with customer migration. For example, suppose National Grid procured block products (which involve fixed quantities of supply at fixed prices). If market prices declined and customers exercised their option to switch to a competitive retail supplier, National Grid could be left with excess supply that it would be forced to sell at a loss, and/or customers would find that an unexpectedly high portion of their SOS supply portfolio is composed of above-market contracts, and these customers would need to pay for the above-market costs through higher SOS rates. This would further encourage customers to switch to competitive retail suppliers, thereby further driving up the SOS rates. In this situation, SOS rates would tend

to increase as market prices decline.

Q. How are these costs and risks managed under a fixed-price full requirements product procurement approach?

A. With full requirements products such as those that National Grid proposes to procure, the amount of supply procured and the actual SOS load always match, so outside of the controlled degree of exposure associated with the set percentage of spot market-priced purchases, risks to customers are substantially mitigated. In other words, with a portfolio consisting of ninety percent fixed-price full requirements products and ten percent spot market purchases, in every hour National Grid's customers will pay a fixed price for exactly ninety percent of their supply.

Q. Under Mr. Hahn's block-and-spot (i.e., block procurement) approach, is there a similar guarantee that ninety percent of the load will be hedged in each and every hour?

A. No. Under Mr. Hahn's block-and-spot approach, there is no fixed-price guarantee for load following service as there is with fixed-price full requirements products; instead, the costs due to deviations in loads and prices from forecasted values are passed on to customers in their SOS rates. In any given hour National Grid would pay a fixed-price on a quantity that may be much less or much more than it actually needs. Therefore, Mr. Hahn's proposed approach exposes customers to more price and volume related risks than the Company's proposal.

Q. Does Mr. Hahn's "base case" depicted in Figure 4 and Exhibit RSH-4 of his testimony[11] account for the uncertainty in loads and prices that you have described?

A. No. Mr. Hahn's "base case" assumes zero percent change in load and price. That is, this "base case" scenario assumes that the forecasted load matches the actual load in the future, and that prices are unchanged.

Q. What is the likelihood that the forecasted load will match the actual load and that there will be no change in price?

A. The likelihood is extremely low. This type of "perfect knowledge," however, with zero percent load and price deviation, is what is assumed in Mr. Hahn's "base case."

Q. What is the implication of the fact that Mr. Hahn has not accounted for the uncertainty in loads and prices?

A. Simply put, Mr. Hahn's "base case" analysis presents an unfair "apples" to "oranges" comparison of the full requirements and block procurement approaches, because he assumes away load and price uncertainty, which does not reflect the real world, and therefore does not capture the expected costs and risks of the block product procurement approach. The $3.92 per MWH figure,[12] or equivalent $11.8 million figure when applied

[11] Mr. Hahn's "base case" is also represented in Exhibits RSH-2 and RSH-3 of his testimony.
[12] As I explain later in this testimony, there are additional problems with the $3.92 per MWH value used by Mr. Hahn, which are not discussed in this question and answer. These problems pertain to Mr. Hahn's misapplication of values that he found in the NorthBridge Study and that he relied upon to calculate this value, and show that the related $11.8 million figure that he quotes is overstated even in a hypothetical world of no load and price uncertainty.

to an estimate of load, that Mr. Hahn represents as the difference between rates under a full requirements product procurement approach and the cost of block products,[13] is associated with a comparison of full requirements product prices, which include compensation to the suppliers to protect customers from (and assume) the costs and risks of an uncertain world, with a projected price under a block procurement approach in a "base case" world that involves no uncertainty with respect to future loads and prices. Fixed-price full requirements products provide guarantees to customers that they will pay no more than the agreed-upon price for all aspects of SOS supply, while still allowing customers to switch to competitive suppliers and pay lower prices if market prices drop below the agreed-upon price. Suppliers of fixed-price full requirements products provide this benefit to customers, and so they include compensation in the prices that they offer for the product to cover the costs and risks that they assume in order to provide this benefit.

Q. Is it surprising that if no uncertainty about future prices and loads is assumed, it would not make sense to purchase a full requirements product that reflects pricing to cover the costs and risks associated with the real and uncertain world?

A. No. It is not surprising that if no uncertainty about future prices and loads is assumed, it would not make sense to purchase a full requirements product that reflects pricing to cover the costs and risks associated with the real and uncertain world. In other words, in

[13] Direct Testimony of Richard S. Hahn, at 23, lines 3-4.

a world with no uncertainty and no risks, it does not make sense to buy insurance. Unfortunately, this is not the world in which we live. In summary, Mr. Hahn's "base case," which fails to reflect market risks and the associated costs of a block procurement approach, provides an inappropriate benchmark for any evaluation of the full requirements product procurement approach, and should not be relied upon to reach any conclusions with regard to the relative attractiveness of different procurement approaches.

b. While Mr. Hahn presents a lot of figures and numbers in his exhibits to support his "base case," his "base case" value boils down to a reliance on, and misapplication of, hand-picked values from the NorthBridge Study.

Q. What information does Mr. Hahn use in his analysis in order to characterize the relative pricing of full requirements products, block products, and spot purchases?

A. Mr. Hahn offers no independent analysis of the relative pricing of full requirements products, block products, and spot purchases. Instead, he relies on values that he found in the NorthBridge Study.[14]

Q. Does Mr. Hahn correctly apply the values that he found in the NorthBridge Study in order to characterize the relative pricing of full requirements products, block products, and spot purchases?

A. No. Mr. Hahn assumes that full requirements product prices are $3.92 per MWH higher than block product costs, and that prices for spot market purchases (which are made for the energy needed to meet residual load needs under his recommended block procurement approach) are generally $2-3 per MWH lower than block product futures prices, and he claims that these assumptions are consistent with the NorthBridge Study.[15] In fact, these assumptions are not consistent with the NorthBridge Study.

Q. Please explain.

A. Mr. Hahn's assumed $3.92 per MWH difference between full requirements product prices and block product costs is calculated from values that he found on page 15 of the NorthBridge Study. This page of the study portrays NorthBridge's calculated $0.72 per MWH (i.e., about $1 per MWH) difference between the expected SOS rate under the representative full requirements versus under the representative block procurement approaches. Mr. Hahn has chosen to include some costs associated with the block procurement approach shown on this page and ignore others to calculate his assumed $3.92 per MWH value for the difference between full requirements product prices and block product costs. I elaborate on this point later in my testimony.

Q. How does Mr. Hahn apply the $3.92 per MWH value in his "base case"?

[14] Direct Testimony of Richard S. Hahn, at 23, lines 1-4.
[15] Direct Testimony of Richard S. Hahn, at 22, lines 21-22, and at 23, lines 1-4.

A. While Mr. Hahn presents a lot of figures and numbers in his exhibits to support his "base case," his "base case" analysis could be replaced by simply multiplying $3.92 per MWH (a figure that he derives based on a misapplication of values that he found in the NorthBridge Study) by his estimate of residential SOS load (3 million MWH) to arrive at his estimated $11.8 million cost difference. After reading Mr. Hahn's testimony, one might be under the impression that Mr. Hahn's "base case" analysis implies that the block procurement approach is $3.92 per MWH cheaper than the full requirements product procurement approach. As I have explained, this ignores costs associated with the block procurement approach, and this conclusion is not consistent with the findings in the NorthBridge Study. In fact, this value is significantly higher than the expected difference of about $1 per MWH shown on page 15 of the NorthBridge Study.

c. Mr. Hahn also provides no empirical basis upon which to assess the expected SOS rates or costs of his recommended block procurement approach, because he provides no justification for the "what if" scenarios he has selected and no quantification of (or basis for quantifying) their likelihoods of occurring.

Q. Does Mr. Hahn provide any empirical basis for the range of possible future scenarios that he considers in his analysis of the full requirements product procurement and block product procurement approaches?

A. No. Mr. Hahn provides no evidence to support why he analyzed the specific scenarios that he did. Mr. Hahn describes his analysis as a "simpler spreadsheet model that

attempted to assess the performance of these procurement methods."[16] Effectively, this model represents an attempt to analyze several "what if" load and price scenarios with no empirical evidence to support the range of scenarios that the model tries to analyze or the likelihoods associated with these scenarios.

Q. What is Mr. Hahn's estimate of the "expected" difference in SOS rates under full requirements product procurement versus under block product procurement?

A. Mr. Hahn doesn't provide an "expected" rate or cost difference in his testimony. That is, he does not provide a probability-weighted average value, considering all possible scenarios. Instead, he shows a "base case" scenario that suffers from an assumption of no load and price uncertainty as I have described previously, along with several "what if" load and price scenarios with no justification for the selection of these scenarios or the range of scenarios selected. Thus, Mr. Hahn presents several random "snapshots" of particular load and price changes but fails to provide a coherent picture that explains how the "snapshots" fit together. Furthermore, as I explain elsewhere in this testimony, Mr. Hahn's calculations pertaining to all of these scenarios suffer from his misapplication of values that he found in the NorthBridge Study and upon which his analysis relies.

Q. Does Mr. Hahn make any claims about the likelihood of various future load and price scenarios occurring, or apply any statistical methods to represent the uncertainty of loads

[16] Direct Testimony of Richard S. Hahn, at 21, lines 6-7.

and prices, in order to calculate expected differences in SOS rates or costs and/or in order to characterize the risks associated with the different procurement approaches?

A. No. Mr. Hahn does not assess the likelihood or assign a probability to any of his load and price scenarios, nor does he provide any factual basis for the likelihoods of the particular load and price scenarios that he analyzes. As I describe later in my testimony, real-world market evidence shows that Mr. Hahn has understated the true range of possible scenarios and that he has not considered important dynamics pertaining to price and load uncertainty. These omissions in his analysis result in an underestimation of the extent of the true costs and risks under the block procurement approach.

d. In addition, Mr. Hahn fails to fully represent the extent of the true costs and risks associated with the block procurement approach, because i) he misinterprets and/or misapplies the values that he found in and relies upon from the NorthBridge Study, ii) he fails to consider the range of possible future scenarios (and important dynamics pertaining to price and load uncertainty) that is supported by real-world evidence in electricity markets, and iii) he overlooks important cost and/or risk components of a block procurement approach.

Q. Are there other reasons why Mr. Hahn's analysis underestimates the extent of the true costs and risks associated with the block procurement approach?

A. Yes. There are three additional reasons why Mr. Hahn's analysis underestimates the extent of the true costs and risks associated with the block procurement approach. First, he misinterprets and misapplies values that he found in the NorthBridge Study, and that he uses to analyze his "what if" scenarios. Second, his analysis fails to consider the range of possible future scenarios (and important dynamics pertaining to price and load uncertainty) that is supported by real-world evidence in electricity markets, leading to an underestimation of both risks and expected costs under the block procurement approach. Third, Mr. Hahn overlooks important cost and/or risk components of a block procurement approach.

Q. Why do you say that Mr. Hahn misinterprets and misapplies values that he found in the NorthBridge Study, and that he uses to analyze his "what if" scenarios?

A. In his scenarios, Mr. Hahn assumes that full requirements product prices are $3.92 per MWH higher than block product costs, and that prices for spot market purchases (for the energy needed to meet residual load needs under his recommended block procurement approach) are generally $2-3 per MWH lower than block product futures prices, and he claims that these assumptions are consistent with the NorthBridge Study.[17] In fact, these assumptions are not consistent with the NorthBridge Study. As I have explained previously, Mr. Hahn's assumed $3.92 per MWH difference between full requirements product prices and block product costs is calculated from values shown on page 15 of the

[17] Direct Testimony of Richard S. Hahn, at 22, lines 21-22, and at 23, lines 1-4.

NorthBridge Study, but his use of that figure is incorrect and ignores other costs cited on that page.

Q. Please explain.

A. As stated on page 15 of the NorthBridge Study, the actual difference between the expected SOS rate under the representative full requirements product procurement approach and the representative block product procurement approach is about $1 per MWH.[18] In every scenario that Mr. Hahn attempts to analyze, he overlooks aspects of block product pricing representing approximately $1.22 per MWH,[19] which serve to reduce the $3.92 per MWH difference used by Mr. Hahn. Mr. Hahn also neglects to account for additional expected costs under the block procurement approach because (as I explain later in this testimony) he omits costs associated with the true range and complexity of price/load dynamics and customer switching. In addition, Mr. Hahn's assumption that additional supply that is required under the block procurement approach, due to inevitable discrepancies between the block product quantities and actual loads, can be obtained from a spot market with prices that are generally $2-3 per MWH lower than block product futures prices is not consistent with the NorthBridge Study. In order to support his assumed $2-3 per MWH discount, Mr. Hahn cites a page of the NorthBridge Study that compares expected SOS rate levels under a pure spot market procurement approach, a block procurement approach, and a full requirements product approach. The

[18] NorthBridge Study, at 15.

difference between the expected SOS rate level under the spot market procurement approach and the block procurement approach is driven by situations in which losses on the excess quantities of block product purchases are borne by decreased SOS loads (i.e., when market prices drop and customers switch from SOS and/or loads are lower than expected values for other reasons), as well as credit and other related costs and risks borne by the suppliers of the block products solicited, and is not predicated on an assumption that spot market purchases can be made at a $2-3 per MWH discount to block product futures prices.

Q. What is the implication of Mr. Hahn's misapplication of the values that he found in the NorthBridge Study?

A. Mr. Hahn's misapplication of the values affects his calculations in every scenario that he attempts to analyze. This is one of the reasons why Mr. Hahn's analysis cannot be relied upon to provide accurate estimates of the differences in the SOS rates under a full requirements product procurement approach versus a block product procurement approach. As shown on page 15 of the NorthBridge Study, the difference in the expected SOS rate under the representative full requirements product procurement approach versus under the representative block product procurement approach is calculated to be $0.72 per MWH, or about $1 per MWH.[20]

[19] I describe these costs later in my testimony.
[20] NorthBridge Study, at 15.

Q. Please explain how Mr. Hahn's analysis fails to consider the range of possible future scenarios (and important dynamics pertaining to price and load uncertainty) that is supported by real-world evidence in electricity markets.

A. Mr. Hahn's representation of the scenarios that could occur, and his characterization of them, falls short of what could happen, and has happened, in electricity markets. The following facts provide evidence of Mr. Hahn's failure to represent the magnitude of the risks, and associated costs, that exist:

1. Market evidence of customer switching and load volatility shows that Mr. Hahn underestimates the uncertainty regarding average customer load levels.
2. The most extreme changes in average price levels reflected in Mr. Hahn's analysis are not even as large as changes that have been witnessed recently in the electric market.
3. Mr. Hahn's scenarios, which are defined by changes in average price and average load levels, provide an inadequate characterization of the uncertainty surrounding the cost to supply SOS customers, because uncertainty within periods (e.g., the on-peak hours in August) with regard to load/usage and price patterns and relationships create additional costs and cost uncertainty overlooked by Mr. Hahn.
4. Mr. Hahn incorrectly assumes that there is no uncertainty in ancillary services costs, but recent market evidence actually shows that such costs can be volatile, and customers must bear the risks of unexpected ancillary services costs under

Mr. Hahn's recommended block procurement approach.

Q. What is the consequence of Mr. Hahn's failure to consider the range of possible future scenarios (and important dynamics pertaining to price and load uncertainty) that is supported by real-world evidence in electricity markets?

A. This oversight has led to an underestimation of both risks and expected costs under the block procurement approach. Mr. Hahn's analysis of the block procurement approach relative to the full requirements product approach is driven by the distribution of future scenarios that he considers. Since Mr. Hahn's representation of the scenarios that could occur, and his characterization of them, falls short of what could happen, and has happened, in electricity markets, Mr. Hahn underestimates the risks that customers would bear under his recommended block procurement approach, and his analysis cannot be used to estimate the expected costs that customers would bear.

Q. Please elaborate further on the actual market evidence that supports your point that Mr. Hahn's analysis fails to represent the magnitude of risks that exist in electricity markets.

A. I elaborate on this market evidence in the following subsections of my testimony.

1) Market evidence of customer switching and load volatility shows that Mr. Hahn underestimates the uncertainty regarding average customer load levels.

Q. What are some of the assumptions Mr. Hahn relies upon regarding average load levels?

A. Overall, Mr. Hahn relies upon an assumption that future average load levels will not deviate much from expectations. One specific assumption upon which Mr. Hahn relies is that residential customers "…are very unlikely or unable to switch to competitive suppliers."[21] Another specific assumption upon which Mr. Hahn relies is that average load levels will never vary from expectations by more than 15%, as not a single scenario that Mr. Hahn analyzes involves an average load level that varies from expectations by more than 15%. In general, the potential for actual loads to deviate from expectations (due to unanticipated customer switching, energy conservation, abnormal weather patterns, unexpected economic growth levels, and/or any other reason) adds to the costs and risks to which customers are exposed under the block procurement approach.

Q. Do you agree with Mr. Hahn's claim and assumption that residential customers "…are very unlikely or unable to switch to competitive suppliers?"[22]

A. I do agree that residential customers are generally less likely to switch to competitive suppliers and generally have fewer competitive options than larger commercial and industrial customers, and that it is likely that residential switching rates in Rhode Island will remain relatively low. But, market evidence indicates that it is possible for relatively large numbers of residential customers to switch. Historical data pertaining to customer switching rates are available for most Northeastern states, as well as a few other states. Exhibit SGF-1 shows that, of the utilities for which historical customer switching data are

[21] Direct Testimony of Richard S. Hahn, at 32, lines 9-11.

available, 22 utilities in eight states have experienced residential switching rates in excess of 15% of eligible customer load, ranging anywhere from 17% to 76%. Given the cost and risk implications under a block procurement approach if relatively large numbers of residential customers were to switch, this possibility cannot be ignored as Mr. Hahn has done.

Q. Does market evidence support Mr. Hahn's assumption that average load levels will never vary by more than 15% during a limited time frame?

A. No. Exhibit SGF-2 shows many instances in which the average residential SOS load level has changed by more than 10% within a nine-month period *due solely to customer switching*. As the exhibit shows, of the utilities for which historical customer switching data are available, 14 of the utilities have experienced residential load changes in excess of 15% within a nine-month period, again due solely to customer switching. A very recent example of the degree to which residential customer switching can change rapidly involves PPL's service area in Pennsylvania. PPL had very little residential switching in its service area for many years, but between September 2009 and March 2010, residential customer switching in its service area increased from 0% to 28%, resulting in a significant, rapid drop in residential SOS load.

Q. Does the NorthBridge Study assume a high level of customer switching?

[22] Direct Testimony of Richard S. Hahn, at 32, lines 9-11.

A. No. As shown in Exhibit SGF-3, under the representative block procurement approach, in about three quarters of the NorthBridge Study scenarios, less than 10% of the load takes service from competitive retail suppliers as of the beginning of 2014. Furthermore, as indicated on page 15 of the NorthBridge Study, the potential for customer switching that is represented in the Study contributes only about $0.50 per MWH[23] to the expected SOS rate under the representative block procurement approach.

Q. Besides changes in customer switching, are there other factors that drive load uncertainty?

A. Yes. Load can change unexpectedly due to changes in the economy, energy conservation, abnormal weather patterns, and a host of other factors. Forecasts of loads for future periods are far from certain. For example, the actual calendar year NEPOOL load has differed from the forecasted value as of the preceding April by between -7% and 4%, a spread of 11%, since 2000.[24]

Q. What do you conclude from the market data regarding load uncertainty?

A. The market data indicate that unexpected changes in load levels can occur, and have occurred in many service areas, and this uncertainty is greater than Mr. Hahn represents it to be. This load uncertainty contributes to both the risks and expected costs borne by customers under the block procurement approach.

[23] This refers to the "Migration Costs" of $0.41 per MWH shown on page 15 of the NorthBridge Study.

2) The most extreme changes in average price levels reflected in Mr. Hahn's analysis are not even as large as changes that have been witnessed recently in the electric market.

Q. In order to reach his conclusions, what are some of the assumptions that Mr. Hahn relies upon regarding average price levels?

A. Mr. Hahn relies upon an assumption that average price levels will never vary from expectations by more than 50%. Not a single scenario that Mr. Hahn analyzes involves an average price level that varies from expectations by more than 50%. Furthermore, Mr. Hahn characterizes an actual average price level that is at least 30% lower than an earlier expectation of that price level as an "extreme" outcome.[25]

Q. Does real-world market evidence support the assumptions regarding average price levels upon which Mr. Hahn relies?

A. No. As a matter of fact, the largest changes in average price levels reflected in Mr. Hahn's analysis are not even as large as changes that have been witnessed recently in the electric market. For example, the average spot price for delivery at Massachusetts Internal Hub for October 2008 through September 2009 was 61% lower than forward

[24] ISO-NE CELT Report, http://www.iso-ne.com/trans/celt/report/index.html.
[25] 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."

prices for the same delivery period as of July 1, 2008, only three months before the start of this delivery period.[26,27] Thus, Mr. Hahn's analysis fails to consider that market prices could change as much as they did just a year or two ago.

Q. Are you aware of any situation in which large unanticipated price changes resulted in significant costs to customers under a block procurement approach?

A. Yes. On October 3, 2007, the Pennsylvania Public Utilities Commission ("PaPUC") issued an order adopting a procurement plan for Wellsboro Electric for a period beginning January 1, 2008.[28] The plan included the use of forward block energy purchases at a regional trading hub, with spot market purchases as needed to meet actual load requirements. Only a few months later, on January 30, 2008, Wellsboro Electric made a filing to the PaPUC, in which it stated that it had been experiencing and would continue to experience an unexpectedly high level of purchased power costs related to market price changes, and requested that the PaPUC allow the company to recover the unexpected increases in costs over a future nine-month period in order to avoid implementing a 109% increase in SOS rates.[29] The PaPUC ultimately approved a plan to recover these costs over a future twelve-month period.[30]

[26] This figure is based on NYMEX forward prices and locational marginal prices, which were obtained from Energy Velocity.
[27] This time span is similar to the time spans over which many fixed-price full requirements products provide protection to customers against costs and risks, so this example provides a fair representation for evaluation of Mr. Hahn's analysis.
[28] Pennsylvania Public Utility Commission Order, Docket No. P-2008-2020257, February 28, 2008, at 2.
[29] Pennsylvania Public Utility Commission Order, Docket No. P-2008-2020257, February 28, 2008, at 1 and 4.
[30] Pennsylvania Public Utility Commission Order, Docket No. P-2008-2020257, February 28, 2008, at 6.

Q. Are there other problems with Mr. Hahn's characterization of costs and risks?

A. Yes. Mr. Hahn overlooks important cost and/or risk components of a block procurement approach. The following subsections of my testimony provide examples of this.

3) Mr. Hahn's scenarios, which are defined by changes in average price and average load levels, provide an inadequate characterization of the uncertainty surrounding the cost to supply SOS customers, because uncertainty within periods (e.g., the on-peak hours in August) with regard to load/usage and price patterns and relationships create additional costs and cost uncertainty overlooked by Mr. Hahn.

Q. How do Mr. Hahn's "what if" scenarios, which are based on changes in average price and average load levels, fail to fully reflect the costs and the cost uncertainty associated with SOS supply?

A. Mr. Hahn has constructed an overly simplistic model of how the cost to supply SOS customers might vary as a function of changes in average price and average load levels. Unfortunately, his methodology fails to account for a significant source of costs and risks to which customers are exposed under the block procurement approach. While Mr. Hahn's "what if" scenarios are superficially designed to capture the risk that average prices or average loads might turn out to be different than previously expected levels, they ignore risk resulting from uncertainty with respect to changes in intra-period price/load patterns. This risk adds to the costs and the cost uncertainty of the block

procurement approach.

Q. Can you provide an example of the type of costs and risks that you describe?

A. Yes. I will describe an illustrative example and then show how Mr. Hahn's methodology does not capture the level of costs and risks that customers face. In this simplified example, a utility employing a block procurement approach must provide supply for SOS customers during a future period of time that consists of two hours. In each hour, a load of 50 MW is forecasted. To hedge this load, the utility purchases a 50 MW block, consistent with Mr. Hahn's prescribed approach. The price for this block product is $80 per MWH. Now, consider an outcome in which the average load turned out to be 50 MW and the average spot price turned out to be $80 per MWH, exactly as had been forecasted. Mr. Hahn's methodology would estimate the cost to customers under this scenario to be simply ($80 per MWH) x (50 MW) * (2 hours) = $8,000. In this situation, Mr. Hahn's methodology indicates that actual costs were exactly as had been forecasted, revealing no cost uncertainty. However, a more detailed examination reveals that this is an overly simplistic view and that significant cost uncertainty is present, even if average prices and loads turn out to match expectations.

Q. Please elaborate as to why Mr. Hahn's methodology fails to capture the true costs and cost uncertainty.

A. Consider that the spot prices in each hour actually turned out to be $100 per MWH in

hour 1, and $60 per MWH in hour 2, for the average of $80 per MWH over the period. Further, consider that the load in hour 1 turned out to be 70 MW and the load in hour 2 turned out to be 30 MW, for an average of 50 MW over the period. Since the utility would rely on the spot market to purchase/sell differences between actual loads and block purchase quantities, the costs to supply customers during this period would be considerably higher than forecasted. In hour 1, the utility is short 20 MW so it would need to purchase that amount in the spot market at $100 per MWH. The total hour 1 cost would be ($80 per MWH) x (50 MW) for the block product + ($100 per MWH) x (20 MW) for the spot purchases = $6,000. In hour 2 the utility is long 20 MW (i.e., has more electricity than its SOS load) so it would need to sell that amount in the spot market at $60 per MWH. The hour 2 cost would be ($80 per MWH) x (50 MW) for the block product + ($60 per MWH) * (-20 MW) for the spot sales = $2,800. The total cost during the two hours would be $8,800 (or $88 per MWH), resulting in a 10% higher cost than had been forecasted. Customers would experience a supply cost surprise of 10%, despite the fact that the average price and the average load turned out to be exactly as had been forecasted. Mr. Hahn's methodology not only misses a key element of the costs and risks, but also reveals a simple case in which his representation of a fully hedged customer is actually not hedged against costs and risks.

Q. Can the manager of a portfolio reduce or eliminate this risk by properly forecasting the "shape" or "pattern" of electrical usage or prices during delivery periods, or by assuming

that the shape of the pattern of historical hourly loads and prices will repeat itself as Mr. Hahn does in his analysis?

A. Unfortunately, no. The risk I have described is not a consequence of expected usage or price patterns and is not mitigated by assuming that a historical hourly pattern repeats itself, but rather is due to *unexpected changes* in those patterns. This significant risk will exist despite the best efforts of the portfolio manager and must be borne by customers when they are supplied by a mix of block products rather than by fixed-price full requirements products. With fixed-price full requirements products, the product suppliers bear these risks to the benefit of customers.

Q. This cost and risk seems straightforward in this simple example, but is there any evidence that it exists in the real world?

A. Yes, there is ample evidence. In order to demonstrate this, I will return to my simple example to illustrate a measurement associated with this risk: "Load-Weighting Gross-Up." In my example, the average spot price per MWH during the delivery period was $80 per MWH. However, the cost to serve customers was actually $88 per MWH, or 10% higher than the average spot price. This figure of 10% is the Load-Weighting Gross-Up.[31] Mr. Hahn assumes that all loads and/or all prices change by some amount proportionately in every hour, and therefore Mr. Hahn captures no uncertainty about the Load-Weighting Gross-Up. Mr. Hahn's simplifying assumption, however, contradicts

[31] The "Load-Weighting Gross-Up" is the load-weighted average spot price divided by the straight average spot

ample empirical evidence showing that the Load-Weighting Gross-Up is volatile.

Q. Please further discuss this empirical evidence.

A. Exhibit SGF-4 shows how the Load-Weighting Gross-Ups pertaining to National Grid's Massachusetts Residential Default Service load for a twelve-month period have changed during only a three-year period, 2007-2009. This exhibit shows that the costs have ranged anywhere between 4% and 10%. This cost variability and unpredictability, ignored in Mr. Hahn's analysis, adds to the level of expected costs and risks under block procurement approaches. Furthermore, it is important to recognize that the effect on costs due to the uncertainty in Load-Weighting Gross-Ups is complex, because market data indicate that relationships exist between Load-Weighting Gross-Ups and average load and price levels. In short, this uncertainty results in a true cost and risk that Mr. Hahn's overly simplistic analytical approach does not capture.

Q. Does this cost and risk arise only from uncertainty within forward block delivery periods (e.g., on-peak hours in August)?

A. No, this is also driven by uncertainty in load and price patterns across months and seasons. Mr. Hahn's methodology evidently assumes that the only risk with regard to loads and prices is that, every hour during the year, all loads will either be higher or lower than initial expectations by the same proportional amount and all prices will either

price, expressed as a percentage.

be higher or lower than initial expectations by the same proportional amount. As in the illustrative example that I have presented, costs and risks exist due to the possibility that load is higher in one month versus in another month relative to expectations, and this is the case even if the total load for the year exactly matches initial expectations. Mr. Hahn's modeling methodology is simply not sufficiently robust to properly quantify the costs and risks that result from the block procurement approach, or even to acknowledge the existence of these costs and risks.

Q. Are these costs reflected in the full requirements product prices in the NorthBridge Study and relied upon by Mr. Hahn?

A. Yes. This is yet another reason why Mr. Hahn compares “apples” and “oranges” in his analysis and fails to either include certain block product procurement costs or fully reflect the costs associated with load and price uncertainty.

4) Mr. Hahn incorrectly assumes that there is no uncertainty in ancillary services costs, but recent market evidence actually shows that such costs can be volatile, and customers must bear the risks of unexpected ancillary services costs under Mr. Hahn’s recommended block procurement approach.

Q. What does Mr. Hahn assume regarding ancillary services costs?

A. Mr. Hahn assumes that there is no uncertainty in ancillary services costs.[32] He supports this assumption by stating, "Inclusion of these costs would add the same amount in all three procurement methods, so their exclusion does not affect the usefulness of, or the conclusions drawn from, the model."[33]

Q. Would inclusion of the uncertainty associated with ancillary services costs have the same impact when evaluating the block procurement approach as it would when evaluating the full requirements product approach?

A. No. Under the block procurement approach, customers would be fully exposed to the ancillary services cost uncertainty. However, under the fixed-price full requirements approach, customers are insulated from this uncertainty because these customers pay a fixed rate agreed upon in advance. Under the fixed-price full requirements approach, the full requirements product supplier absorbs unexpected cost increases to the benefit of the customer. In short, by not including the uncertainty in ancillary services costs, Mr. Hahn has understated the risks to customers associated with his block procurement approach.

Q. Do you have any market evidence that ancillary services costs can be volatile and uncertain?

A. Yes. Ancillary services costs can in fact be quite volatile. For example, during the last three years, National Grid Residential Default Service load-weighted ancillary services

[32] Direct Testimony of Richard S. Hahn, at 22, lines 12-14.

costs[34] in the Southeastern Massachusetts Zone ("SEMA") for a twelve-month period have varied significantly, ranging from $3 per MWH to $13 per MWH.[35]

5) Mr. Hahn has ignored certain costs associated with the purchase of block products.

Q. Has Mr. Hahn ignored other costs included in the NorthBridge Study?

A. Yes. As I mentioned earlier, Mr. Hahn overlooks aspects of block product pricing representing approximately $1.22 per MWH, which serve to reduce the $3.92 per MWH difference that he calculated. Drivers of these costs include credit requirements (suppliers require compensation for risks associated with the fact that the utility does not post collateral, and even if the utility is required to post collateral then there are expected costs associated with financing that collateral), as well as the benefit provided by bidders to customers from having bids held open for approval during a period in which market conditions may change. Bids for block product prices for delivery at the Rhode Island Zone may also reflect the costs and risks associated with the fact that the Rhode Island Zone is not a liquid trading hub. Inclusion of all of these costs is necessary for an apples-to-apples comparison with full requirements product pricing.

Q. Does Mr. Hahn provide any rationale for excluding these costs?

[33] Direct Testimony of Richard S. Hahn, at 22, lines 14-16.
[34] Ancillary services costs include charges for First and Second Contingency Net Commitment Period Compensation, Regulation (or Automatic Generation), Forward and Real-Time Reserve Markets, Inadvertent Energy, NEPOOL Expenses, and ISO Schedules 2 and 3.
[35] ISO-NE Wholesale Load Cost Report, http://www.iso-ne.com/markets/mkt_anlys_rpts/whlse_load/select/WhlseLoad.do; http://www.nationalgridus.com/energysupply/.

A. No. Yet, this cost is shown on the graph on page 15 of the NorthBridge Study directly next to the bar from which Mr. Hahn derived the $3.92 figure upon which his analysis relies.[36]

6) Mr. Hahn does not explicitly consider other potential costs and risks of his block procurement approach.

Q. Are there other factors that contribute to the relative costs and risks of a block versus a full requirements procurement approach?

A. Yes. The potential for changes in market rules and legislation also contributes to the costs and risks of the block procurement approach relative to the fixed-price full requirements approach. For instance, consider a simple example in which Utility A implements a block procurement approach and Utility B implements a fixed-price full requirements product approach. During the delivery period, the impact on customers due to changes in legislation or market rules would be very different. Utility A, relying on a block procurement approach, would pass through those costs to customers while the third-party full requirements product supplier(s) to Utility B would bear those costs and risks to the benefit of Utility B's customers. Thus, risks are allocated differently between the two approaches.

Q. Can you provide a few examples of actual or potential legislative or market rule changes

[36] According to the Direct Testimony of Richard S. Hahn, at 23, footnote 3, "The assumed REC cost of $3 per MWH

that could impact SOS costs?

A. Sure. PJM's implementation of its Reliability Pricing Model ("RPM") in the capacity market is a recent example of a market rule change that had an impact on the costs of providing SOS service within PJM. Likewise, market rules related to forward capacity markets ("FCM") in ISO-New England ("ISO-NE") continue to evolve and are subject to change, and this could result in unanticipated changes in SOS supply costs in Rhode Island in future delivery periods. Also, new state legislation, such as the pending bill in the Pennsylvania State Assembly that would facilitate "opt-out" customer aggregation programs, could increase load uncertainty and result in additional supply cost surprise. In addition, federal energy legislation could impact future SOS costs. My main point here is that unexpected changes do occur, and it is impossible to predict what will happen in the future. Fixed-price full requirements supply products provide customers insurance against these unanticipated changes during the term of the full requirements contract, while a block procurement approach leaves customers exposed to unanticipated costs and risks.

Q. Since you have frequently mentioned that the block procurement approach exposes customers to greater uncertainty, is it possible that the block procurement approach could result, in hindsight, in a lower or higher SOS rate than the full requirements product approach, over a finite period of time?

was deducted from the FR residual of $6.92 per MWH to arrive at the $3.92 per MWH differential."

A. Yes, depending upon how the future unfolds, the block procurement approach may result in a lower or higher SOS rate over a finite period of time. For example, Mr. Hahn points to the NorthBridge Study to indicate that there is the potential for "pleasant price surprises" with regard to SOS supply costs under the block procurement approach.[37] Indeed, our analysis shows that costs may be lower (or higher) than expected. However, the fact still remains that the block procurement approach clearly exposes customers to greater risks of very costly outcomes for customers than the fixed-price full requirements product approach does. The fact that the block procurement approach exposes customers to a greater chance of a "pleasant price surprise" as well as a greater chance of very costly outcomes for customers is simply a reflection of the fact that the block procurement approach does not provide customers with the same level of protection against unexpected costs.

Q. Could Mr. Hahn's argument regarding "pleasant price surprise" also be applied to a procurement approach involving purchases of 100% of SOS supply needs from the spot market?

A. Yes. If Mr. Hahn desires to maximize the chance of a large "pleasant price surprise," then he should advocate for residential SOS supply to be procured entirely using spot market purchases because this results in SOS supply costs that reflect the full uncertainty of spot market price levels, and spot market price levels may be much lower (or higher)

[37] Direct Testimony of Richard S. Hahn, at 20, lines 1-10.

than expectations. The heavy reliance on full requirements contracts in National Grid's proposed SOS plan effectively serves to manage the supply cost risks for residential customers.

Q. What do you conclude about Mr. Hahn's analysis?

A. Mr. Hahn's analysis contains serious flaws and should not be relied upon to reach any conclusions with regard to the relative attractiveness of different procurement approaches.

IV. In contrast, the NorthBridge Study is a robust analysis that captures the complexity and uncertainty of electric markets, and reflects actual market information about costs and risks.

Q. Please provide a brief description of how the NorthBridge Study analyzes the costs and risks associated with various procurement approaches.

A. The NorthBridge Study involves the application of rigorous analysis to a large amount of real-world data. Specifically, the Study utilizes statistical techniques to develop 2,000 scenarios of possible future outcomes regarding wholesale market prices, loads, and hourly load-weighting. The scenarios are calculated using actual historical market data, in a manner that does not implicitly assume that history simply repeats itself, but instead in a manner that captures the volatilities and correlations of the market observed

historically. By doing so, the Study is able to objectively assess risks associated with possible future outcomes. The Study also incorporates analysis of the prices obtained for over forty different SOS supply products recently solicited by ten different utilities, in which the costs of various components of the product (using information available at the time of the solicitation) were compared to the price obtained for the product. This analysis of numerous actual solicitations is useful for two reasons. First, it allows for incorporation of the pricing of such products in the overall scenario analysis. Second, it provides insights into the drivers of differences across solicitations in the calculated residual compensation required by suppliers to cover difficult-to-quantify costs and risks.[38] The Study applies numerous procurement and ratemaking approaches to the scenarios, and evaluates the approaches using various metrics that pertain to objectives with respect to SOS, including expected rate level, supply cost surprise, and rate volatility. In short, the NorthBridge Study is very robust.

Q. How would you contrast the robustness of the NorthBridge Study with that of Mr. Hahn's analysis?

A. Mr. Hahn characterizes his analysis as a "simpler spreadsheet model."[39] Unfortunately, Mr. Hahn has simplified out real-world market dynamics and costs and risks, or has just

[38] For example, suppliers generally assume greater costs and risks in fixed-price full requirements SOS products to supply groups that include larger customers. In addition, measured residual compensation values are sometimes calculated using historical data for "observable" cost components when forward price values are not available, and historical costs may vary from expectations.
[39] Direct Testimony of Richard S. Hahn, at 21, lines 6-7.

plain overlooked them. The following table compares the robustness of the NorthBridge Study with that of Mr. Hahn's analysis:

Aspect of the Analysis	NorthBridge Study	Mr. Hahn's Analysis	Result
Supply product pricing	Based on an analysis of over forty different products solicited by ten different utilities	• No independent analysis of supply product pricing • Relies upon NorthBridge Study values	Mr. Hahn's analysis misapplies NorthBridge Study values, leading to underestimations of the costs of the block procurement approach
Potential changes in average load levels	Uncertainty is characterized based on the application of statistical techniques to actual market data, resulting in 2,000 scenarios of possible future outcomes	Offers some hypothetical scenarios with no justification for them	Mr. Hahn's analysis underestimates the uncertainty regarding average load levels, and thereby underestimates the costs and risks under the block procurement approach
Potential changes in average price levels	Uncertainty is characterized based on the application of statistical techniques to actual market data, resulting in 2,000 scenarios of possible future outcomes	Offers some hypothetical scenarios with no justification for them	Mr. Hahn's analysis underestimates the uncertainty regarding average price levels, and thereby underestimates the costs and risks under the block procurement approach
Potential for intra-period load and price patterns to deviate from expectations	Statistical approach captures the actual market dynamics associated with intra-period load and price patterns	Does not capture this uncertainty at all	By not capturing this uncertainty, Mr. Hahn's analysis underestimates the costs and risks under the block procurement approach
Evaluation metrics	Evaluates procurement approach against five different metrics that pertain to objectives with respect to SOS	Does not evaluate performance along metrics such as expected SOS rate level, year-to-year rate changes, etc.	Mr. Hahn's analysis is unable to capture aspects of approaches which may be important to customers
Overall justification of scenarios	Incorporates probabilities associated with results, based on the application of statistical techniques to actual market data	Only allows for hand-picked scenarios, with no justification for or assignment of probabilities to these scenarios	The choice of scenarios in Mr. Hahn's analysis is arbitrary, and lacks any empirical supporting analysis

Q. While the NorthBridge Study is very robust, does it capture all of the costs and risks associated with SOS supply?

A. No. While the pricing of full requirements products is fully represented, there are additional costs and risks that are not represented in the NorthBridge Study (nor in Mr. Hahn's analysis) that would increase the relative costs and risks to customers under the block procurement approach. For example, when evaluating the block procurement approach, imputed debt costs as well as uncertainty regarding the costs of capacity, ancillary services, and renewable portfolio standards are not included.

V. Mr. Hahn's qualitative comparison of his recommended block procurement approach to an insurance policy with a deductible is inaccurate because the block procurement approach fails to adequately hedge risks for customers when customers most need insurance (i.e., when market outcomes deviate significantly from expectations).

Q. Please explain how Mr. Hahn characterizes the capability of his recommended block procurement approach to hedge risks for SOS customers.

A. On page 31 of his testimony, Mr. Hahn makes claims regarding the similarity between his recommended block procurement approach and purchasing an auto insurance policy with a deductible. Specifically, Mr. Hahn explains that most people purchase auto insurance to protect against the cost of being in an accident, and that when people do

purchase auto insurance, they have a choice between purchasing a policy with no deductible or with some level of deductible such as $500 per incident. Mr. Hahn further explains that a policy with no deductible completely hedges against the cost of an accident, but a higher premium must be paid for this type of policy. Mr. Hahn likens this type of policy with the fixed-price full requirements product approach.[40] Mr. Hahn then states that a policy with a deductible involves a lower premium. Mr. Hahn concludes by stating that "[the] Block Product method is analogous to auto insurance with a deductible"[41] in that "[it] is not a complete hedge, but it is a reasonable, cost-effective one."[42]

Q. Does Mr. Hahn's analogy reasonably portray the protections provided to customers under his recommended block procurement approach?

A. No. The implication that his recommended block procurement approach provides a similar type of protection as purchasing auto insurance with a deductible is inaccurate. An auto insurance policy with a deductible provides a type of protection for the policyholder that is very different from any protections that Mr. Hahn's block product approach provides for customers. In the case of auto insurance with a deductible, in the event of being in an auto accident, the amount of damages that the policyholder must pay

[40] Direct Testimony of Richard S. Hahn, at 31, lines 1-13.
[41] Direct Testimony of Richard S. Hahn, at 31, lines 15-16.
[42] Direct Testimony of Richard S. Hahn, at 31, lines 16-17.

is limited to no more than the amount of the deductible that he/she chose when he/she purchased the policy.[43]

Q. Under the block procurement approach, is there any limit on the rates that SOS customers may be forced to pay once the block products are procured?

A. No. Under Mr. Hahn's recommended block procurement approach, there is no limit on the rates that SOS customers may be forced to pay due to outcomes that deviate from expected conditions. Furthermore, Mr. Hahn's own analysis indicates that SOS rates will be higher than base case levels if prices and loads are higher than expected or if they are lower than expected.[44] The block procurement approach is more like an insurance policy that covers the policyholder for damages up to the amount of the deductible, but not for damages beyond that. In other words, while the block procurement approach provides some measure of cost protection when outcomes are somewhat similar to expectations, when deviations are large or when outcomes reflect risks beyond simple uncertainty in average prices or loads, customers may experience high rate levels or rapid rate increases.

Q. Why is insurance typically purchased?

[43] While it is true that the limit applies to all damages up to the policy's coverage amount, this distinction is not relevant to Mr. Hahn's discussion of the exposure and costs associated with the inclusion/exclusion of the deductible in the policy to be purchased.
[44] Direct Testimony of Richard S. Hahn, Exhibit RSH-9.

A. Insurance is typically purchased to protect against unexpected and very adverse outcomes, such as a serious accident, illness, or loss. Under the block procurement approach, rates and costs may be stable if market outcomes are similar to expectations, but this is a false assurance of stability, because customers truly would be exposed to the potential for significant harm. In contrast, under National Grid's proposal, residential customers are provided a fixed-price guarantee for ninety percent of SOS customers' full requirements needs, regardless of how prices, loads, or other conditions deviate from expectations.

VI. Conclusion

Q. Does this conclude your rebuttal testimony?

A. Yes, it does. Since this testimony was prepared before requested information from the Division was received, I reserve the right to supplement this testimony as appropriate upon reviewing any information that is subsequently provided.

Residential Switching Rates In Excess of 15% of Eligible Load

State		Utility Company	Highest Historical Residential Switching (%)	Month In Which Highest Switching Occurred	Notes
CT	1	Connecticut Light & Power	25%	Apr-10	
	2	United Illuminating	28%	Apr-10	
MA	3	Commonwealth Electric Company	54%	Aug-09	
MD	4	Potomac Electric Power Company	17%	May-03	(a)
ME	5	Maine Public Service Company	36%	Aug-03	(b)
NY	6	Consolidated Edison	20%	Jan-10	
	7	New York State Electric & Gas	19%	Aug-09	
	8	National Grid	17%	Jan-10	
	9	Orange & Rockland Utilities	40%	Jun-05	
	10	Rochester Gas & Electric	32%	Sep-06	
OH	11	Cleveland Electric Illuminating	76%	Jun-05	
	12	Ohio Edison Company	36%	Jun-05	
	13	Toledo Edison Company	53%	Jun-05	
PA	14	Duquesne Light Company	35%	Apr-01	
	15	Philadelphia Electric Company	35%	Apr-01	
	16	Pike County Light & Power	73%	Oct-08	
	17	PPL Electric Utilities Corporation	28%	Apr-10	
TX	18	AEP Texas Central Company	65%	Sep-09	
	19	AEP Texas North Company	68%	Sep-09	
	20	CenterPoint Energy	51%	Sep-09	
	21	Oncor Electric	41%	Sep-09	
	22	Texas-New Mexico Power	70%	Sep-09	

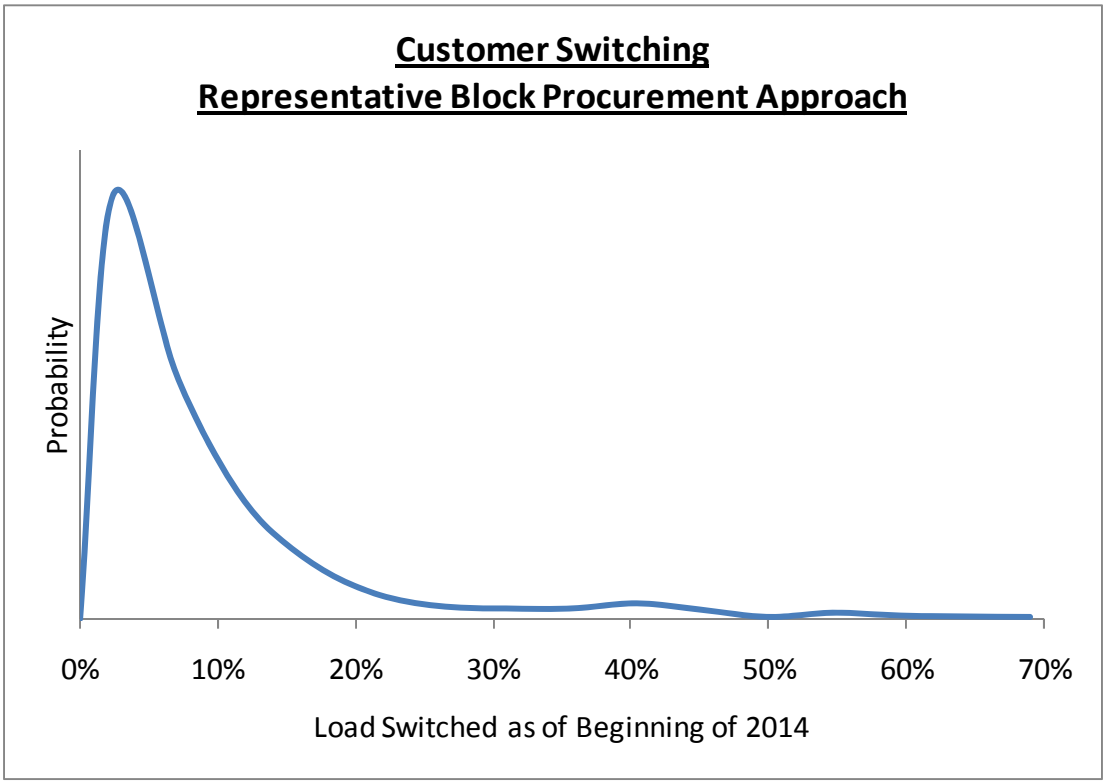
Note: All figures are a percentage of residential MWH delivered unless noted.
(a) Figure is a percentage of peak MW obligation.
(b) Figure is for the residential / small commercial customer class, which includes small commercial customers under 50 kW.
Source: State public utility commission websites.

Percentage Changes In Residential Retained Load Levels In Excess of 10%, During A Nine-Month Period

State		Utility Company	Change in Residential Retained Load (%)	Time Frame During Which Switching Occurred	Notes
CT	1	Connecticut Light & Power	-15%	Jul-09 to Apr-10	
	2	United Illuminating	-16%	Jul-09 to Apr-10	
DC	3	Potomac Electric Power Company	-12%	Mar-02 to Dec-02	
MA	4	Commonwealth Electric Company	-46%	Jan-05 to Sep-05	
ME	5	Maine Public Service Company	38%	Aug-03 to May-04	(a)
NY	6	Orange & Rockland Utilities	-17%	Oct-02 to Jul-03	
	7	Rochester Gas & Electric	16%	Sep-06 to Feb-07	
OH	8	Cleveland Electric Illuminating	274%	Jun-05 to Mar-06	
	9	Ohio Edison Company	-33%	Jun-09 to Dec-09	
	10	Toledo Edison Company	88%	Jun-05 to Mar-06	
PA	11	Duquesne Light Company	-14%	Jan-00 to Oct-00	
	12	Philadelphia Electric Company	29%	Oct-01 to Jul-02	
	13	PPL Electric Utilities Corporation	-28%	Oct-09 to Apr-10	
TX	14	AEP Texas Central Company	-19%	Aug-08 to May-09	
	15	AEP Texas North Company	-20%	Jan-06 to Oct-06	
	16	CenterPoint Energy	-12%	Jun-06 to Mar-07	
	17	Oncor Electric	-10%	Mar-05 to Dec-05	
	18	Texas-New Mexico Power	-34%	Feb-08 to Nov-08	

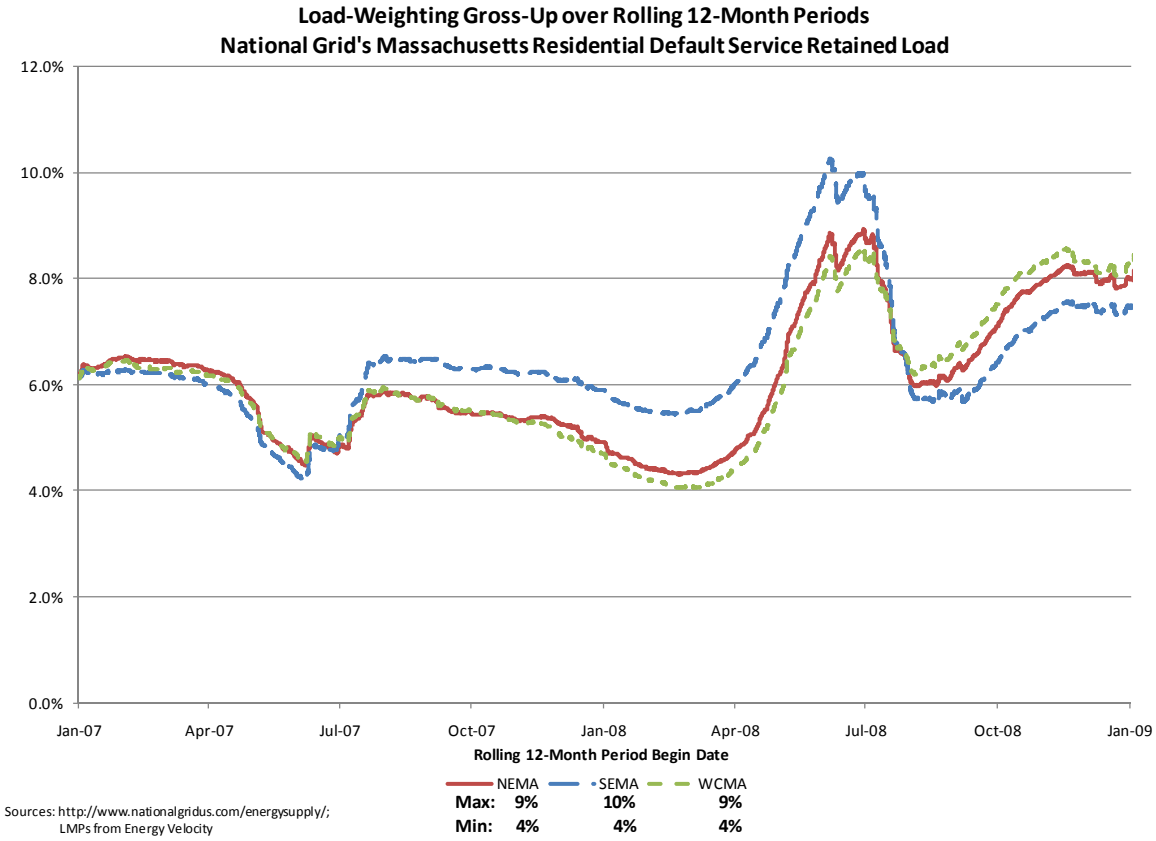
Note: All figures are a percentage of residential MWH delivered unless noted.
(a) Figure is for the residential / small commerical customer class, which includes small commercial customers under 50 kW.
Source: State public utility commission websites.

Exhibit SGF-3



Representative Block Procurement Approach Load Switched as of Beginning of 2014	
Average Load Switched	9%
% of Scenarios with Load Switched Less Than 5%	47%
% of Scenarios with Load Switched Less Than 10%	72%
% of Scenarios with Load Switched Less Than 20%	90%

Exhibit SGF-4



Sources: http://www.nationalgridus.com/energysupply/;
LMPs from Energy Velocity