STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

EnergyNorth Natural Gas, Inc.
d/b/a National Grid NH

DOCKET DG 10-017

Direct Testimony
of
Paul M. Normand

Cash Working Capital
Lead-Lag Study

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I. POSITION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is Paul M. Normand. I am a principal with the firm of Management Applications Consulting, Inc. ("MAC"). MAC's headquarters is 1103 Rocky Drive, Suite 201, Reading, Pennsylvania 19609.

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE.

A. A detailed list of my qualifications and experience is provided in Attachment PMN-LL-1.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I have been retained by and am testifying on behalf of EnergyNorth Natural Gas, Inc. d/b/a National Grid NH ("National Grid NH" or "the Company").

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present and sponsor the cash working capital ("CWC") requirements of National Grid NH for its base revenue requirements and purchased gas expense. The Company has identified its revenue requirements on a pro forma basis, and we have computed the CWC for that adjusted test year. The CWC requirements were computed using the methodology recommended in the October 31, 2008 direct testimony of George R. McCluskey in National Grid NH's Docket No. DG 08-009. Mr. McCluskey took the position that non-cash items should be removed from the calculation of the CWC. Therefore, in

calculating CWC in this case, I have removed the uncollectible accounts expense, depreciation and amortization expense, provision for deferred income taxes, and income for return.

On a pro forma basis, the CWC requirements for National Grid NH are $1,507,192 for its base revenue requirements and $4,385,813 for its purchased gas expense. These CWC requirements represent the funds that are needed due to the lag between the time when payments are made by the Company and when the recovery of those funds is obtained from customers. This base revenue CWC requirement is included in the Company's overall revenue requirement calculation by means of the cash working capital allowance included in rate base. At an appropriate point in this proceeding, the Company will need to adjust the revenue requirement as originally filed in this case to reflect the difference between the level of CWC included in rate base in the original filing and the level of CWC calculated in the study I am presenting here.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony consists of four sections. Section I introduces my background information. Section II describes the purpose and organization of my testimony. Section III presents the lead-lag study I prepared on behalf of National Grid NH to determine the pro forma CWC. A summary schedule detailing the lead and lag days by revenue and cost component for the test year on a pro forma basis is provided as Attachment PMN-LL-2. Finally, Section IV of my direct testimony summarizes my conclusions and recommendations for CWC on a pro forma basis.

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III. CASH WORKING CAPITAL

1. Definition of CWC

Q. PLEASE DEFINE CASH WORKING CAPITAL.

A. CWC is the amount of investor-supplied capital required to fund the day-to-day operations of a company after accounting for the timing differences between booked and actual revenues and expenses. CWC represents amounts funded by investors to provide service prior to payment for such service by customers. As such, base rates requirements CWC is typically an addition to a company's rate base.

Q. DID YOU PERFORM A STUDY TO ESTIMATE THE CWC OF NATIONAL GRID NH FOR THE ADJUSTED TEST YEAR?

A. Yes. Attachment PMN-LL-2 presents the results of the lead-lag study conducted for National Grid NH using the pro forma revenue requirements for the test year ending June 30, 2009. As shown on this attachment, the CWC related to purchased gas expense is $4,385,813, and the Company's rate base addition for CWC related to delivery service is $1,507,192.

Q. WHAT IS A LEAD-LAG STUDY?

A. A lead-lag study is an analysis designed to determine the funding required to operate a company on a day-to-day basis. A lead-lag study compares (1) the timing difference between the receipt of service by customers and their subsequent payment for these services and (2) the timing difference between the incurrence of costs by National Grid NH and its subsequent payment of these

costs. Therefore, a lead-lag study must compute both a revenue lag (or lead) and an expense lead (or lag). Attachment PMN-LL-2, page 1 of 3, summarizes the lead-lag study results for National Grid NH. The CWC was developed using systematic reviews of all cash flows for National Grid NH's revenues and operations expenses. The lead-lag study measured the base revenue requirement needed for National Grid NH's day-to-day natural gas operations for the 12-month pro forma period ending June 30, 2009. The lead-lag study also measured separately the CWC for purchased gas.

Q. PLEASE DEFINE THE TERMS "LAG DAYS" AND "LEAD DAYS" AS USED IN YOUR TESTIMONY.

A. Revenue lag days are the number of days between delivery of service to National Grid NH's customers and the subsequent receipt by the Company of payment for the service (revenue lag). Expense lag days are the number of days between the receipt of goods or services provided to National Grid NH by vendors and the payment by the Company for those goods and services.

Because National Grid NH's customers receive service prior to paying for it, the Company experiences a revenue lag in its daily operations. This revenue lag is computed based upon a study of the time lag between the date when customers receive service and the date when the customers pay for such service. The longer the revenue lag, the greater the length of time that investor capital is employed to fund the Company's day-to-day operations. The revenue lag of

National Grid NH is 53.17 days, as developed on Attachment PMN-LL-2, page 2 of 3.

Generally, expenses are paid by National Grid NH after vendors have provided their goods or services, which results in an expense lag. On occasion, National Grid NH pays for services before they are provided. In these instances, the expenses lead their service period. The expense lag is calculated as the number of days between the date when National Grid NH receives goods or services from a vendor and the date when the Company pays for such goods or services. If the expenses are paid before the services are provided, then the expense lag is expressed as a negative amount. Consequently, any increase in the number of expense lag days results in a reduction of the amount of working capital required for ongoing National Grid NH operations.

The arithmetic difference between the computed revenue lag and the computed expense lag is the number of days the Company must provide funding for the utility's daily operations. As shown on Attachment PMN-LL-2, page 1 of 3, line 363, the Company's revenues lag the recovery of purchased gas costs by 14.27 days, and, as shown on line 44, the Company's revenues lag the recovery of expenses recovered in base rates by 14.08 days.

2. Lead-Lag Study General Approach

Q. PLEASE DESCRIBE THE APPROACH YOU USED IN PREPARING YOUR LEAD-LAG STUDY.

I began the lead-lag study with the selection of the per-books revenues and expenses for the12-month period ended June 30, 2009 to form the basis for my analysis. I determined the lag days in the recovery of revenue by type of revenue (i.e., sales and other revenues). For operation and maintenance ("O&M") expenses, I developed lag days for each of several types of expenses (i.e., purchased gas, labor, employee pensions and benefits, and other O&M expenses). In addition, I developed lag days for taxes, including property taxes, other taxes excluding property taxes, federal income tax, state income tax, and interest expense. Once the lag days for the test year are established on a per-books basis, they are applied to the test year pro forma revenue requirements. The net of the revenue lag day and each expense item lag are then multiplied by the test year pro forma expense amounts to determine the Day Weighted Amount of CWC. The total of the Day Weighted Amounts for all cash expenses was then divided by 365 days to obtain the average daily CWC.

3. Methods of Computation

Q. PLEASE DESCRIBE YOUR CALCULATION OF REVENUE LAGS.

A. The calculation of revenue lags is summarized on Attachment PMN-LL-2, page 2. As previously described, "revenue lag" is the length of time that occurs between

the Company's provision of service to its customers and the subsequent receipt of payment for those services. The existence of a revenue lag makes it necessary for investors to provide the funding for the Company to pay its operating costs during the lag period.

The measurement of revenue lag days typically consists of four components: (1) service lag, (2) billing lag, (3) collection lag and (4) revenue float. Since the time periods for these four components are mutually exclusive, revenue lag is computed by adding together the total number of days associated with each of the four revenue lag components. This total number of lag days represents the amount of time between the recorded delivery of service to customers and the receipt of the related revenues from customers.

Q. PLEASE DESCRIBE HOW YOU CALCULATE SERVICE LAG.

A. The service lag is the average time span between the mid-point of the customer's consumption interval, also known as the usage period, and the time that such usage is recorded by the Company for billing purposes. This service period determines the average length of time over which the billed services are provided and establishes a common point in time from which to measure (1) the time of reimbursement for the billed services, and (2) the time at which the accrued costs for the service period are actually paid. For virtually all utilities, the service lag is one-half of an average month or 15.22 days.

Q. PLEASE DESCRIBE YOUR CALCULATION OF BILLING LAG.

A. The billing lag is the time required to process and send out customer bills. The billing lag begins at the end of the service period when customer consumption is metered, and it ends when the bills are rendered and billings are posted to accounts receivable. The billing lag may be influenced by factors such as whether automated or manual meter reading systems are employed, the generation of invoices from metering data and other processes affecting the time to post billings to accounts receivable. National Grid NH utilizes an automated meter reading system and posts its meter reading daily for billing later the same night. As a result, weekends and holidays do not influence the Company's billing lag. National Grid NH's billing lag was approximately one day.

Q. PLEASE DESCRIBE YOUR CALCULATION OF COLLECTION LAG.

A. The collection lag identifies the time delay between the issuance of customer bills and the receipt of the billed revenues. Collection lag begins with the posting of bills and ends with the receipt of payment. Collection lag may be influenced by payment arrangements, contract terms, postal delivery delays, customer inquiries, delinquent accounts, service termination practices, and other factors. As I will discuss later in my testimony, I have employed the accounts receivable turnover ratio method to determine the collection lag of 37.03 days.

Q. PLEASE DESCRIBE THE FINAL COMPONENT OF REVENUE LAG, REVENUE FLOAT.

A. Revenue float is the time difference between when funds are received from customers until customer payments clear the banks and are available to the Company. To clarify, there are two periods of float. The first is associated with the Company's payment of services from vendors. Expense float, or lag, is discussed later in my direct testimony. The second period of float is the delay in receipt of cash from customer payments. In this latter instance, National Grid NH's cash requirements are reduced by the delay in mailing and check processing. Many lead-lag studies assume that revenue float and check float are equal and offsetting and, therefore, can be removed. A closer examination reveals that the issue is much more complex. The majority of National Grid NH's larger payments are made by wire transfer with a much shorter lag than a conventional mailed check. On the revenue side, only a small portion of customer payments are made by cash, credit card or bank transfer. Again, these payments have smaller lag times to clear than conventional checks. Since the dollar volume of utility payments exceed their receipts made by cash, credit card and bank transfer, the inclusion of check float in the lead-lag study should slightly increase CWC requirements. I have chosen to avoid this level of complexity with the knowledge that our simplifying assumption will slightly understate CWC and will not disadvantage customers. The inclusion of float would logically cause a slight increase to total net lag and a commensurate increase in cash working capital requirements, albeit with a significant level of additional complexity to quantify

the actual impact. Therefore, I have chosen not to quantify float for revenues or expenses in this study.

Q. TURNING TO THE TIMING OF CASH FLOWS ASSOCIATED WITH EXPENSES, HOW DID YOU DETERMINE THE LAG ASSOCIATED WITH PURCHASED GAS EXPENSE?

A. The calculation of expense lags is summarized on Attachment PMN-LL-2, page 3. Purchased gas expense, shown on line 2, is the largest category of expense and comprises over two-thirds of the Company's total revenue requirements. Each purchased gas invoice for the year was scrutinized in the preparation of this calculation. Consistent with general industry practice and without exception, each invoice represents billings for the prior calendar month. The service period for each monthly invoice is defined as the 24-hour period ending at 10:00 AM. Consequently, each invoice is for the period beginning at 10:00 AM on the first day of the previous month and ending at the same time in the current month. Payments are made on approximately the 25th of the following month, depending on weekend and holiday schedules. The column labeled "Lag Days" shows the lag between the mid-point of the service period and the payment date. In order to compute the average lag, the individual invoices were weighted by the dollar amount of the invoice. The weighted average of the lag from each month's purchased gas expense is calculated as 38.89 days. Note that our calculations do not address gas placed in storage. The lead-lag study identifies the lag between receipt of gas and payment of invoices. The additional working capital required

to support gas in fuel inventory after the payment of invoices is outside of the lead-lag study. That is, the lead-lag study addresses the working capital requirements of the Company from the time gas is delivered until it is recorded in fuel inventory. The fuel inventory amount is excluded from the lead-lag calculation.

Q. HOW IS THE LAG FOR LABOR EXPENSE DETERMINED?

A. The majority of the Company's payroll stems from weekly or bi-weekly payroll disbursements. Using sample data, we measured the lag between the mid-point of the pay period and the pay date. However, not all labor costs earned by employees in the pay period are paid out as salary, the difference being payroll withholdings. In order to make an accurate calculation of total labor costs, we identified all labor-related costs and identified when the Company actually expended the cash. These labor-related costs include all salary including incentive compensation, payroll taxes including withholding taxes, and a wide range of benefits. Regular payroll costs are the largest component of labor costs and have the shortest payment lag. However, other components of labor costs have relatively long delays. For example, incentive compensation pay was earned from April 2008 to March 2009 and was paid in mid-June 2009, resulting in a much longer expense lag. In addition to direct labor expense, we examined other labor-related costs to the Company, including payroll taxes, benefit deductions, and 401(k) contributions as discussed below.

Q. PLEASE DESCRIBE HOW THE LAG IS CALCULATED FOR PENSIONS AND BENEFIT EXPENSE AND COMPANY 401(k) MATCH EXPENSES.

A. The method for calculating Pensions and Benefit Expenses and 401(k) Company Match Expense follows the same approach used for all other lag calculations. For each expense, the service period and its mid-point were determined. Then the payment date was established. The lag was then computed as the difference between the payment date and the mid-point of the service period. Next, a weighted average of each expense was computed to determine the overall average for this category.

Q. WERE OTHER CATEGORIES OF O&M EXPENSE ANALYZED SEPARATELY AND INCLUDED IN THE EXPENSE LAG?

A. Yes. Regulatory Commission Expenses, Account 928, were analyzed separately and included in the calculations of the expense lag. Again, the lags for each expense item were computed as the difference between the payment date and the mid-point of the service period.

Q. HOW WAS THE EXPENSE LAG CALCULATED FOR EXPENSES ALLOCATED FROM THE SERVICE COMPANIES?

A. The expenses allocated from the Service Companies consisted of Labor and Other O&M expenses that are charged to numerous O&M accounts. The expense lag of 65.21 days that is assigned to these expenses is based on the Service Agreements the Operating Companies have with the Service Companies. Per the Service Agreements, the Service Companies are to render a bill to each Operating

Company by the 20th of each month for the services provided in the preceding month. The Operating Companies then have 30 days to pay the invoice after it is received.

Q. ARE THERE OTHER O&M EXPENSES THAT WERE INCLUDED IN THE CALCULATION OF EXPENSE LAG?

A. Yes, the Company provided a comprehensive list of all cash disbursements made during the year. In terms of total dollar expenditures, the majority of these expenses have already been identified and their lags computed. However, approximately $3.4 million of expenses were not accounted for in these calculations. These remaining expenses will be shown under the heading of "Other O&M Expenses – Direct" in Attachment PMN-LL-2, page 3 of 3. Because these expenses are made up of thousands of vouchers prepared throughout the course of the test year, it is a daunting task to examine each voucher, identify its service period and payment date, and calculate the expense lag. From a practical standpoint, statistical sampling is the only reasonable solution, and, therefore, that is the approach I have taken.

Q. PLEASE DESCRIBE THE PROCESS FOR SAMPLING OF "OTHER O&M" EXPENSE.

A. In order to develop an efficient sampling plan to study the remaining expenses, I used a stratified sequential sample to estimate the lag of this wide variety of expenses. In total, four strata totaling nearly 332 samples were drawn from the population of all test year vouchers. Based on a sample of this size relative to the

size of the population, I can estimate the lag on the entire population of invoices to within plus or minus one percent at a 90 percent confidence level. Narrowing this bandwidth would require much larger samples without any reasonable expectation that the average lag would change. Considering the thousands of cash expenses incurred by National Grid NH in this general category of Other O&M Expenses, the sampling procedure provides a reasonable estimate for the expense lag for this category without the considerable and unnecessary burden of reviewing huge quantities of data.

Q. DID YOU INCLUDE ANY OTHER EXPENSES BESIDES O&M EXPENSES IN THE CALCULATION OF THE EXPENSE LAG?

A. Yes. Since Property Taxes, Other Taxes, Federal and State Income Taxes, and Interest on Long Term and Short Term Debt represent cash outlays, they were included in the fiscal 2009 period in the calculation of CWC. All property tax payments made during 2009 were analyzed, and since they are generally prepaid, they produced a negative lag. Other Taxes consist mostly of Payroll Taxes, Unemployment Taxes, and Other Taxes. Each type of tax was analyzed separately and assigned a lag based on the service periods and payment dates. Federal and State Income Taxes were assigned lags based on the statutory required fiscal tax year equal tax payments. Interest on Long & Short Term Debt was assigned lags based on the actual interest payments for the June 30, 2009 fiscal period.

4. Results of National Grid Lead-Lag Study

Q. WHERE HAVE YOU PRESENTED THE RESULTS OF THE CWC CALCULATIONS FOR THE PRO FORMA TEST YEAR?

A. The results of the lead-lag study are summarized on Attachment PMN-LL-2, page 1. This page summarizes the revenue lag from page 2 and the cash expenses and corresponding expense lags from page 3 and computes the Company's pro forma CWC requirements for purchased gas expense and base rate revenue requirements.

Q. HAVE YOU IDENTIFIED THE NET LAG DAYS BETWEEN REVENUE AND EXPENSE FOR NATIONAL GRID NH FOR THE TWELVE MONTHS ENDING JUNE 30, 2009 ON A PRO FORMA BASIS?

A. Yes. As indicated by the data in Attachment PMN-LL-2, page 1, the net lag is computed for each of the cash expenses. The net lag for National Grid NH's purchased gas expense is 14.27 days and for the base rate revenue requirements 14.08 days. The positive lags indicate that cash working capital is required to compensate for the fact that the lag in the recovery of revenues is greater than the lag in the payment of expenses.

On a pro forma basis, National Grid NH's CWC requirements corresponding to these net lags for the June 30, 2009 test year are $4,385,813 for purchased gas and $1,507,192 for base rate revenue requirements. The base rate CWC requirement represents the capital that must be provided and included as an addition to rate base.

Q. REFERRING TO ATTACHMENT PMN-LL-2, COULD YOU DISCUSS THE STRUCTURE OF YOUR PRO FORMA LEAD-LAG STUDY SUMMARY?

A. The summary of the National Grid NH lead-lag study on page 1 consists of three sections. Line 1 shows the revenue lag. Lines 5 through 28 detail the expense lag data. Lines 300 to 44 show CWC in total and segregated between purchased gas and base revenue requirements.

In order to compute subtotals and totals, the rightmost working column, labeled "Day Weighted Amount," is also shown in Attachment PMN-LL-2, page 1. This column is the product of the annual expense and the net lag days. Row 27, Column 4, of Attachment PMN-LL-2, page 1, will show the weighted average net lag of 14.22 days for all expenses.

Q. ARE THERE ANY ADJUSTMENTS THAT YOU ARE RECOMMENDING TO THE CWC CALCULATIONS ONCE THE PROPOSED RETURN LEVEL IS DETERMINED?

A. Yes. The calculations are based on the pro forma costs. Income Taxes and Return are not indicative of the cash working capital requirements of the Company on an ongoing basis. For example, under normal conditions, the rates in effect are expected to allow the Company's stockholders to earn a reasonable return on their investment, and the utility must pay income taxes on this return. Therefore, the level of CWC computed on a pro forma basis using test year return understates the level of CWC required for normal operations at the proposed

return level because the CWC does not reflect the income taxes that will have to be paid on the proposed increase in return. The CWC requirement should be recalculated using the allowed return level and resulting change in income taxes.

Q. PLEASE EXPLAIN THE CALCULATION OF CWC FOR PURCHASED GAS EXPENSES AND BASE REVENUE REQUIREMENTS.

A. Attachment PMN 2, page 1, shows that revenues are received 53.17 days after the service is provided to customers (line 4), and purchased gas expenses are paid 38.89 days after service has been provided by vendors (line 7). Thus, there is a net lag of 14.27 days (53.17 revenue lag days - 38.89 expense lag days = 14.27 net lag days) for gas expenses, as shown on Rows 5 and 36. Because the recovery of revenues lags the payment of gas expenses, the CWC amount is a positive amount. The CWC required to support purchased gas expense is computed by dividing the 14.27 days of lag by 365 and then multiplying by the purchased gas expense, as shown on line 38.

The base revenue requirement CWC net lag is 14.08 days. This is computed on lines 43 and 44 by taking the difference between the total cash working capital requirements on line 33 and the purchased gas working capital requirements on line 38. Again, because the recovery of revenues lags the base revenue requirement expenses, the CWC amount is a positive addition to rate base.

IV. SUMMARY

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I have prepared a lead-lag study to separately compute the lag days associated with revenue collection from customers and the lag days associated with the cash expenses, segregated between purchased gas expense and all other. The net of the revenue lag and expense lags are used to determine the net lag days for National Grid NH. Using the net lag days, I have computed the CWC associated with the pro forma expenses of the Company.

The Purchased Gas CWC requirement is $4,385,813, and the net lag is 14.27 days. The base revenue CWC requirement is $1,507,192, and the net lag is 14.08 days. The CWC requirements should be adjusted to an ongoing basis for the allowed return and resulting change in income taxes.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

ATTACHMENT
PMN-LL-1

Qualifications of Paul M. Normand

QUALIFICATIONS OF PAUL M. NORMAND

Q. Mr. Normand, what is your present position?

A. I am a principal in the consulting firm of Management Applications Consulting, Inc. (MAC), 1103 Rocky Drive, Suite 201, Reading, PA 19609. This company provides consulting services to the utility industry in such field as loss studies, econometric studies, cost analyses, rate design, expert testimony, and regulatory assistance.

Q. What is your educational background?

A. I graduated from Northeastern University in 1975, with a Bachelor of Science Degree and a Master of Science Degree in Electrical Engineering-Power System Analysis. I have attended various conferences and meeting concerning engineering and cost analysis.

Q. What is your professional background?

A. I was employed by the Massachusetts Electric Company in the Distribution Engineering Department while attending Northeastern University. My principal areas of assignment included new service, voltage conversions, and system planning. Upon graduation from Northeastern University, I joined Westinghouse Electric Corporation Nuclear Division in Pittsburgh, Pennsylvania. In that position, I assisted in the procurement and economic analysis of electrical/electronic control equipment for the nuclear reactor system.

In 1976, I joined Gilbert Associates as an Engineer providing consulting services in the rate and regulatory area to utility companies. I was promoted to Senior Engineer in 1977, Manager of the Austin office 1980, and Director of Rate Regulatory Service in 1981.

In June, 1983, I left Gilbert to form a separate consulting firm and I am now a principal and President of Management Applications Consulting, Inc. My principal areas of concentration have been in loss studies, economic analyses, and pricing.

Q. Have you testified in support of any cost studies that you participated in or performed?

A. Yes, I have testified or submitted written testimony about such studies before the following regulatory agencies: the Maine Public Utility Commission, the Public Utility Commission of Texas, Illinois Commerce Commission, New Hampshire Public Utilities Commission, New Jersey Board of Public Utilities, New York Public Service Commission, Pennsylvania Public Utility Commission, the Massachusetts Department of Public Utilities, the Kentucky Public Service Commission, the Arkansas Public Service Commission, the Public Service Commission of Louisiana, the Public Utilities Commission of Ohio, the Public Service Commission of Missouri, the Delaware Public Service Commission, the Maryland Public Service Commission, the Indiana Utility Regulatory Commission, the North Carolina Utilities Commission, the Kansas Corporation Commission, and the Federal Energy Regulatory Commission.

Q. Could you please briefly discuss your technical experience?

A. I have performed numerous accounting and marginal cost of service studies, time differentiated bundled and fully unbundled cost studies for both electric and gas utilities since 1980. I have also used such studies in the design and presentation of detailed rate proposals before regulatory agencies. My additional experience has been in the area of unaccounted for loss evaluations for electric and gas utilities for over twenty-four years. These studies

include a detailed review of each system and the calculation of appropriate recovery factors.

ATTACHMENT
PMN-LL-2

Pro Forma Lead-Lag Study Summary

National Grid NH
Cash Working Capital Requirements
12 Months Ended Jun 30, 2009
Lead Lag Summary

Line No		Annual Expense (1)	Revenue (Lead) Lag Days (2)	Expense (Lead) Lag Days (3)	Net (Lead) Lag Days (4)	Day Weighted Amount (5)	Source (6)
1	**Total Revenue Lag**		53.17				
2							
3	**Total Expense Lag**						
4	**Operation & Maintenance Expense**						
5	Purchased Gas	$112,156,611	53.17	38.89	14.27	$1,600,821,910	Page 3 of 3 - Line 2
6	Labor - Direct	$5,406,362	53.17	20.22	32.94	$178,098,092	Page 3 of 3 - Line 3
7	Labor - Allocated	$4,575,008	53.17	65.21	-12.04	-$55,092,537	Page 3 of 3 - Line 4
8	Employee Pensions & Benefits - Direct	$3,605,256	53.17	26.75	26.42	$95,240,278	Page 3 of 3 - Line 5
9	Employee Pensions & Benefits - Allocated	$1,585,086	53.17	65.21	-12.04	-$19,087,708	Page 3 of 3 - Line 6
10	Regulatory Commission Expense	$657,982	53.17	-89.00	142.17	$93,542,846	Page 3 of 3 - Line 8
11	Other O&M Expenses - Direct	$3,410,580	53.17	34.50	18.67	$63,658,689	Page 3 of 3 - Line 9
12	Other O&M Expenses - Allocated	$4,194,137	53.17	65.21	-12.04	-$50,506,071	Page 3 of 3 - Line 10
13							
14	**Other Taxes**						
15	Other Taxes Excluding Property Taxes	$332,748	53.17	17.97	35.19	$11,710,752	Page 3 of 3 - Line 16
16	Property Taxes	$4,457,169	53.17	-24.83	78.00	$347,662,947	Page 3 of 3 - Line 17
17							
18	**Income Taxes**						
19	Federal Income Taxes	$3,687,983	53.17	30.00	23.17	$85,436,805	Page 3 of 3 - Line 21
20	State Income Taxes	$928,128	53.17	30.00	23.17	$21,501,260	Page 3 of 3 - Line 22
21							
22	**Interest Expense**						
23	Interest on Long-Term Debt	$5,898,313	53.17	91.25	-38.08	-$224,629,757	Page 3 of 3 - Line 32
24	Interest on Short'-Term Debt	$344,791	53.17	45.66	7.51	$2,589,386	Page 3 of 3 - Line 33
25							
26							
27	**Net of Revenue less Expense Lag**	$151,240,154	53.17	38.94	14.22	**$2,150,946,891**	Sum of Lines 5 to 24
28	Days					365	
29							
30	**Avg Daily Cash Working Capital Requirements**					**$5,893,005**	Line 27 / Line 28
31							
32							
33	**Cash Working Capital Requirements**					**$5,893,005**	Line 30
34							
35	**Purchased Gas Working Capital**						
36	Purchased Gas Net Lag Days			14.27			Line 5 Col 4
37	Purchased Gas Cost					$112,156,611	Line 5 Col 1
38	Purchased Gas CWC					**$4,385,813**	Line 36 / 365 X Line 37
39							
40	**Base Revenue Requirements Working Capital**						
41	Total Cash Working Capital Requirements					$5,893,005	Line 33
42	Less: Purchased Gas Cash Working Capital					$4,385,813	Line 38
43	Base Revenue Requirements Working Capita					**$1,507,192**	Line 41 - Line 42
44	Base Revenue Net Lag Days			14.08			Line 43/(Line 27-Line5) X 365
45							
46							
47							
48							
49							
50							

National Grid NH
Cash Working Capital Requirements
12 Months Ended Jun 30, 2009
Revenues Lag Summary

Line No	Revenue Lag	Revenues Billed	Lead (Lag) Days	Source	Wtg Delivery Dollar Days
1	Service Lag		15.22	See Note 1	
2					
3	Billing Lag				
4	Cycle Read Customers		1.00	See Note 3	
5					
6	Collection Lag		37.03	W/P Supporting Page 1 Line 21	
7					
8	Total Firm Gas Sales Revenues	$157,555,632	53.25	Line 1 + 4 + 6	$8,389,280,031
9					
10	Sales for Resale	$0	38.89	W/P Supporting Page 2	$0
11	Gas Revenues Total	$157,555,632	53.25		$8,389,280,031
12					
13	Revenues from Transportation of Gas of Others	$7,597,409	53.25	Line 8	$404,535,152
14	Total Sales Revenues	$165,153,041	53.25		$8,793,815,184
15					
16	Unbilled Revenues	-$2,991,010	53.25	Line 8	-$159,260,701
17					
18	Late Payment Charges	$1,192,394	42.43	See Note 2	$50,590,550
19					
20	Reconnect Fees	$245,820	53.25	Line 8	$13,089,045
21					
22	NG Check Charge	$25,905	42.43	See Note 2	$1,099,090
23					
24	Broker Balancing Charges	$0	53.25	Line 8	$0
25					
26	Interruptible Sales	$0	53.25	Line 8	$0
27					
28	Non Core Sales	$733,421	53.25	Line 8	$39,052,074
29					
30	Total Revenue Lag	$164,359,571	53.17		$8,738,385,241
31					
32					

33 Notes:
34 1. Computed as 365.25/12/2
35 2. Fees are assessed on the next billing. Lag is computed as the collection lag on Line 6 plus the average of 5.4 days from due date.
36 3. Meters are read from 7AM to 3PM and posted to accounts receivable on the following day.
37

National Grid NH
Cash Working Capital Requirements
12 Months Ended Jun 30, 2009
Cost of Service Lead Lag Summary

Line No		Revenue Req Amount	Lead (Lag) Days	Source	Weighted Amount
1	**Operation & Maintenance Expense**				
2	Purchased Gas	$112,156,611	38.89	W/P Supporting Page 2	$4,362,126,677
3	Labor - Direct	$5,406,362	20.22	W/P Supporting Page 46 Line 73	$109,338,000
4	Labor - Allocated	$4,575,008	65.21	See Note 2	$298,328,639
5	Employee Pensions & Benefits - Direct	$3,605,256	26.75	W/P Supporting Page 96 Line 31	$96,437,739
6	Employee Pensions & Benefits - Allocated	$1,585,086	65.21	See Note 2	$103,360,825
7	Uncollectible Accounts - Acct 904	$5,518,477		Non Cash Item	
8	Regulatory Commission Expense	$657,982	-89.00	W/P Supporting Page 120 Line 5	-$58,560,398
9	Other O&M Expenses - Direct	$3,410,580	34.50	W/P Supporting Page 121 Line 27	$117,669,116
10	Other O&M Expenses - Allocated	$4,194,137	65.21	See Note 2	$273,492,714
11	Total Operating & Maintenance Expenses	$141,109,499			
12					
13	**Depreciation & Amortization Expense**	$8,042,552		Non Cash Item	
14					
15	**Other Taxes**				
16	Other Taxes Excluding Property Taxes	$332,748	17.97	W/P Supporting Page 132 Line 16	$5,980,238
17	Property Taxes	$4,457,169	-24.83	W/P Supporting Page 139 Line 34	-$110,691,882
18	Total Other Taxes	$4,789,918			
19					
20	**Income Taxes**				
21	Federal Income Taxes	$3,687,983	30.00	W/P Supporting Page 172 Line 13	$110,639,487
22	State Income Taxes	$928,128	30.00	W/P Supporting Page 173 Line 13	$27,843,836
23	Total Income Taxes	$4,616,111			
24					
25	**Provision for Deferred Income Taxes**	-$2,794,596		Non Cash Item	
26					
27	**Loss From Disposition of Property**	$0			
28					
29	**Interest on Customer Deposits**	$19,557		See Note 1	$0
30					
31	**Return**				
32	Interest on Long-Term Debt	$5,898,313	91.25	W/P Supporting Page 174 Line 5	$538,221,048
33	Interest on Short'-Term Debt	$344,791	45.66	W/P Supporting Page 176	$15,741,856
34	Income for Return	$2,333,427		Non Cash Item	
35	Total Return	$8,576,531			
36					
37	**Total Requirements**	$164,359,571			
38					
39	Notes:				
40	1. Customer Deposits and Interest is included as a deduction from Rate Base and therefore excluded from the lead lag study.				
41	2. Lag for Service Company charges is per the Service Agreements where a monthly invoice is submitted on the 20th for the preceding month's charges.				
42	Invoice is then payable by the 30th day after the invoice is received.				
43					