COUCH WHITE
COUNSELORS AND ATTORNEYS AT LAW

Couch White, LLP
540 Broadway
P.O. Box 22222
Albany, New York 12201-2222
(518) 426-4600

Michael B. Mager
Partner

Direct Dial: (518) 320-3409
Telecopier: (518) 320-3498
E-Mail: mmager@couchwhite.com

September 25, 2012

VIA ELECTRONIC FILING

Hon. Jaclyn A. Brilling
Secretary
New York State Public Service Commission
Three Empire State Plaza
Albany, New York 12223-1350

Re: Cases 12-E-0201 and 12-G-0202 – Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric and Gas Service

Dear Secretary Brilling:

Attached for filing in the above-referenced proceeding is the rebuttal testimony and exhibits of Jeffry Pollock on behalf of Multiple Intervenors.

Respectfully submitted,

COUCH WHITE, LLP

Michael B. Mager

Michael B. Mager

MBM/cgw
Attachment
cc: ALJ Harriman (via E-Mail; w/attachment)
ALJ Stegemoeller (via E-Mail; w/attachment)
Active Parties (via E-Mail; w/attachment)
S:\DATA\Client13 15101-15400\15277\Corres\2012\Brilling 09-25-12.docx

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

PROCEEDING ON MOTION OF THE COMMISSION AS TO THE RATES, CHARGES, RULES AND REGULATIONS OF NIAGARA MOHAWK POWER CORPORATION D/B/A NATIONAL GRID FOR ELECTRIC SERVICE	**CASE NO. 12-E-0201**
PROCEEDING ON MOTION OF THE COMMISSION AS TO THE RATES, CHARGES, RULES AND REGULATIONS OF NIAGARA MOHAWK POWER CORPORATION D/B/A NATIONAL GRID FOR GAS SERVICE	**CASE NO. 12-G-0202**

Rebuttal Testimony

of

JEFFRY POLLOCK

On Behalf of

Multiple Intervenors

September 2012

J. POLLOCK
INCORPORATED

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

PROCEEDING ON MOTION OF THE COMMISSION AS TO THE RATES, CHARGES, RULES AND REGULATIONS OF NIAGARA MOHAWK POWER CORPORATION D/B/A NATIONAL GRID FOR ELECTRIC SERVICE		CASE NO. 12-E-0201
PROCEEDING ON MOTION OF THE COMMISSION AS TO THE RATES, CHARGES, RULES AND REGULATIONS OF NIAGARA MOHAWK POWER CORPORATION D/B/A NATIONAL GRID FOR GAS SERVICE		CASE NO. 12-G-0202

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GLOSSARY OF ACRONYMS

Term	Definition
CP	Coincident Peak
ECOSS	Embedded Class Cost-of-Service Study
ECOSS-CU	Embedded Cost-of-Service filed with Corrections and Updates
ECOSS-Historical	Embedded Cost-of-Service filed with Test Year Revenues and Costs
kWh	Kilowatt Hour
MI	Multiple Intervenors
NCP	Non-Coincident Peak
NiMo	Niagara Mohawk Power Corporation d/b/a National Grid
ROR	Rate of Return
SERP	Staff Electric Rates Panel
SGRP	Staff Gas Rates Panel
Staff	New York State Department of Public Service Staff
ZI	Zero Intercept

REBUTTAL TESTIMONY OF JEFFRY POLLOCK

1. INTRODUCTION AND SUMMARY

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Jeffry Pollock; 12655 Olive Blvd., Suite 335, St. Louis, MO 63141.

Q ARE YOU THE SAME JEFFRY POLLOCK WHO HAS PREVIOUSLY FILED DIRECT TESTIMONY IN THIS PROCEEDING ON BEHALF OF MULTIPLE INTERVENORS?

A Yes.

Q WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A The primary purpose of my rebuttal testimony is to respond to two sets of issues raised in the Direct Testimony of New York State Department of Public Service Staff (Staff). First, I address the proposed embedded class cost-of-service study (ECOSS) advanced by the Staff Electric Rates Panel (SERP), which relies on historical revenues and costs (ECOSS-Historic). Second, I address revisions proposed by the Staff Gas Rates Panel (SGRP) to the Zero Intercept (ZI) analysis performed by Niagara Mohawk Power Corporation d/b/a National Grid (NiMo). As discussed later, the ZI analysis is used to determine how gas distribution mains should be classified.

Finally, I will present the results of MI's Revised ECOSS-CU corrected for an error in the derivation of the demand allocation factors used in NiMo's ECOSS-CU. This error was called to NiMo's attention, and I understand that the utility will be filing an errata or otherwise correcting its ECOSS-CU.

Q ARE YOU SPONSORING ANY EXHIBITS WITH YOUR REBUTTAL TESTIMONY?

A Yes. I am sponsoring **Exhibits ___ (JP-R1)** through **____ (JP-R6).**

Summary

Q PLEASE SUMMARIZE YOUR FINDINGS AND CONCLUSIONS.

A The SERP's proposed ECOSS-Historic should be rejected because it improperly allocates Test Year revenues and costs using Rate Year allocation factors. As a result, the earned rates of return for the various customer classes are distorted. Further, the SERP's approach violates the Matching Principle. Under this fundamental ratemaking construct, the revenues, costs, and allocation factors used in a cost-of-service study should be derived using consistent data – either from the Test Year or the Rate Year, but not both. Further the ECOSS-Historic contains the same flaws as NiMo's ECOSS-CU. These flaws were discussed in my Direct Testimony. For all of these reasons, the SERP's proposed ECOSS-Historic should be rejected and not used for revenue allocation or rate design purposes herein.

The SGRP's recommendation to classify only 30% of gas distribution mains as customer-related (versus NiMo's proposed 45%) is based on a faulty ZI analysis. First, the SGRP used non-standard pipe sizes and omitted certain smaller, standard pipe sizes. This distorted the analysis. Only standard pipe sizes should have been used. Correcting this flaw would result in classifying 62% of distribution mains as customer-related. Additionally, due to its use of non-standard size pipes, the SGRP was forced to use non-linear trend lines for steel and cast iron pipe. Importantly, however, the trend lines used by the SGRP were not the best fit. Applying better-fitting trend lines to the SGRP's pipe sizes would result in classifying 57% of

distribution mains as customer-related. Thus, correcting the SGRP's ZI analysis demonstrates that NiMo's proposed 45% classification of distribution mains as customer-related is clearly reasonable, if not understated. For these reasons, the SGRP ZI analysis should be rejected, and the Commission should adopt NiMo's proposed classification of gas distribution mains.

Finally, the Rate Year coincident peak (CP) and non-coincident peak (NCP) demand allocation factors in NiMo's ECOSS-CU need to be revised to correct a misstatement in the Test Year load factor. NiMo uses a three-year average load factor to project Rate Year CP and NCP demands. However, the Test Year load factor used *loss-adjusted* kilowatt-hour (kWh) sales, whereas the other two years used kWh sales *at the meter*. The error can be corrected by using Test Year kWh sales at the meter. This correction changes the earned rates of return (ROR) by between 6 and 28 basis points. I have made, and present here, corresponding corrections to MI's Revised ECOSS-CU.

2. STAFF ELECTRIC RATES PANEL

Q IS THE SERP PROPOSING TO USE A DIFFERENT ECOSS FOR DETERMINING CLASS REVENUE ALLOCATION IN THIS CASE?

A Yes. The SERP is proposing to use an ECOSS-Historic rather than the ECOSS-CU, which is the basis for NiMo's class revenue allocation proposal.

Q WHAT IS THE DIFFERENCE BETWEEN THE ECOSS-HISTORIC AND THE ECOSS-CU?

A The ECOSS-Historic uses revenues and costs for the Test Year (twelve months ended December 31, 2011). The ECOSS-CU uses Rate Year revenues and costs.

Q WHY IS THE SERP PROPOSING TO USE AN ECOSS-HISTORIC?

A The SERP expressed concern that inaccuracy of the forecasted data used in the ECOSS-CU could have a significant impact on the results. Its preference for using an ECOSS-Historic is based on an assumption that:

> ... all costs and cost allocators are known and updates are not required.[1]

Q IS THE SERP CORRECT TO ASSUME THAT ALL COSTS AND COST ALLOCATORS ARE KNOWN IN THE ECOSS-HISTORIC?

A No. The only difference between the ECOSS-Historic and the ECOSS-CU is the use of Test Year (rather than Rate Year) revenues and costs. Both the ECOSS-Historic and ECOSS-CU use the same *Rate Year* customer, demand and energy allocation factors. In other words, the ECOSS-Historic allocates *Test Year* revenues and costs using *Rate Year* allocation factors. Thus, while the SERP eschewed the use of Rate

[1] *Prepared Testimony of Staff Electric Rates Panel* - Corrected at 8.

Year revenues and costs, purportedly because they were not known and could require updating, it nevertheless failed to change or modify that portion of NiMo's ECOSS-CU which uses *Rate Year* customer, demand and energy allocation factors.

Q IS IT PROPER TO USE TEST YEAR REVENUES AND COSTS AND RATE YEAR ALLOCATION FACTORS?

A No. Using Test Year revenues and costs and Rate Year allocation factors violates the Matching Principle.

Q WHAT IS THE MATCHING PRINCIPLE?

A The Matching Principle is a fundamental regulatory construct that guides how rates are set. Under the Matching Principle, a consistent set of assumptions is used in determining all ratemaking components (*e.g.*, sales, revenues, rate base and operating expenses). The premise behind the Matching Principle is the fact that rates are set as follows:

$$Rate = \frac{Rate\ Year\ Costs}{Rate\ Year\ Sales}$$

Thus, in order to set rates properly, the costs must be determined for the same period as the corresponding sales. As applied to an ECOSS, the Matching Principle means using the same set of data for revenues, expenses, and allocation factors. By mixing Test Year revenues and costs with Rate Year allocation factors, the SERP ECOSS-Historic violates the Matching Principle.

Q IS THE MATCHING PRINCIPLE WIDELY RECOGNIZED?

A Yes. The Matching Principle is a fundamental accounting principle. The Federal Accounting Standards Advisory Board (FASAB) states:

> 118. Matching revenue with cost in a uniform manner is essential in evaluating agency performance and setting price. Cost and revenue must pertain to the same output in order to estimate the extent to which the revenue covers the cost. Therefore, costs should be matched against the provision of goods and services with revenue matched against those costs and thus with revenue also matched against the same provision of goods and services. When this is done, the gross and net cost of an entity can be compared with the related outputs and outcomes to evaluate its operating performance, pricing policy, and economic decisions. Similarly, when this is done, the net cost to the taxpayer can be estimated for the entity's related outputs provided to the public.[2]

The Matching Principle is also recognized in countless regulatory decisions. For example:

> ***The matching principle strives for a reasonable match of the capital structure, the rate base, expenses, and revenues.*** As the Supreme Court recognized in *Northwestern Bell Telephone Company v. Iowa State Commerce Commission*, 359 N.W.2d 491, 498 (Iowa 1984):
>
> ***It is fundamental to a proper test year that costs, both investment and operating, and revenues match, i. e., that they be consistent with each other.*** Unless there is a matching of costs and revenues, the test year is not a proper one for fixing just and reasonable rates. (Emphasis added)[3]

Q WHAT COULD HAPPEN IF TEST YEAR REVENUES AND COSTS ARE ALLOCATED USING RATE YEAR ALLOCATION FACTORS?

A Allocating Test Year revenues and costs using Rate Year allocation factors can result in distorted ECOSS results. This distortion is demonstrated in **Exhibit ___ (JP-R1)**. This Exhibit compares the net delivery revenues (lines 1-3) between the ECOSS-Historic and ECOSS-CU and the percent of allocated costs as indicated by

[2] Federal Accounting Standards Advisory Board, *FASAB Handbook of Federal Accounting Standards and Other Pronouncements, as Amended*, June 30, 2011 at SFFAS-7, page 45.

[3] Re Iowa Electric Light and Power Company, Docket No. RPU-91-9, Iowa Utilities Board, December 28, 1992, PUR Slip Copy at 2.

the energy (lines 4-6), 1CP demand (lines 7-9) and Primary NCP demand (lines 10-12) allocation factors. The Test Year demand allocation factors were derived from Test Year energy sales using the same approach that NiMo used in deriving the Rate Year demand allocation factors. The earned rate of return will be lower if the change in revenues (line 3) is greater than the corresponding change in allocated costs (lines 6, 9, and 12), or the change in allocated costs exceeds the change in revenues. The former circumstance applies to the S.C. 2-ND, S.C. 3-A Sub-transmission and S.C. 3-A Transmission classes (columns 3, 9 and 10), while the latter circumstance applies to the Residential (S.C.-1) class (column 1).

Table 1:
Relative Rates of Return
ECOSS-CU Vs. ECOSS-Historic

Rate Class	ECOSS-CU	ECOSS-Historic
S.C. 1	0.85	0.73
S.C. 1C	1.76	2.20
S.C. 2 ND	1.67	1.61
S.C. 2 Dem	1.16	1.36
S.C. 3 Sec	1.14	1.44
S.C. 3 Pri	1.27	1.96
S.C. 3 Sub/Tran	0.92	0.41
S.C. 3-A Sec/Pri	0.85	1.30
S.C. 3-A Sub	0.97	0.93
S.C. 3-A Tran	0.60	0.02
S.C. L	1.90	2.13

The impact on the S.C. 3 Sub-transmission/Transmission class (column 7) is especially problematic because of the compound effect of lower Test Year delivery revenues and higher allocated costs.

Q WHY ARE SOME CLASSES MORE SIGNIFICANTLY AFFECTED BY ALLOCATING TEST YEAR REVENUES AND COSTS USING RATE YEAR ALLOCATION FACTORS?

A The earned rate of return is the net operating income (revenues – expenses) divided by rate base. Higher voltage classes have a smaller rate base relative to the required delivery revenues. Thus, small changes in delivery revenues will have a much greater impact on the earned rates of return. This is shown in **Exhibit ___(JP-R1)**, line 13, which measures how a change in delivery revenues affects the earned rates of return. As can be seen on line 13, the ratios for the S.C. 3 Sub-transmission/Transmission, S.C. 3-A Sub-transmission, and S.C. 3-A Transmission classes are much higher than for the other customer classes. This demonstrates the much greater sensitivity of these classes to changes in revenues.

Q SHOULD THE ECOSS-HISTORIC BE ADOPTED FOR USE IN THIS PROCEEDING?

A No. The ECOSS-Historic violates the Matching Principle because it inappropriately uses Rate Year allocation factors to allocate historic revenues and costs. The results are distorted as previously illustrated. For this reason alone, the ECOSS-Historic should be rejected.

Q ARE THERE ANY OTHER ASPECTS OF THE ECOSS-HISTORIC THAT YOU DISAGREE WITH?

A Yes. As stated previously, the same allocation methodology and factors are used in both the ECOSS-Historic and the ECOSS-CU. However, as discussed in my Direct Testimony, the ECOSS-CU is flawed. The flaws are:

- The ECOSS-CU inappropriately allocates distribution load dispatching expense to all customer classes, including transmission and sub-transmission customers that are not served from the distribution system.
- The ECOSS-CU inappropriately allocates distribution load dispatching expense to all customers on the basis of loss-adjusted kilowatt-hour (kWh) sales, which is: (a) not consistent with cost causation; (b) contrary to NiMo's proposed allocation of transmission load dispatching expense on a coincident peak (CP) basis; and (c) at odds with industry practice.
- The ECOSS-CU inappropriately classifies the *secondary* distribution network and the *primary* distribution network – both of which are accounted for in FERC Accounts 364-367 – in an inconsistent manner. NiMo updated the classification of *secondary* distribution network to between 54% and 64% customer-related, but failed to similarly update the classification of its *primary* distribution network.

Even if, *arguendo*, this Commission elects to rely on an ECOSS-Historic in this proceeding, the flaws in NiMo's ECOSS-CU identified and discussed in my Direct Testimony still are present in the SERP's ECOSS-Historic and need to be remedied.

Q HOW WOULD THESE CHANGES IMPACT THE ECOSS-HISTORIC RESULTS?

A Making these changes to the ECOSS-Historic would substantially change the earned ROR as shown in the table below:

Table 2: Rates of Return at Present Rates ECOSS-Historic: SERP Proposed Vs. MI Revised		
Rate Class	**As Proposed**	**MI Revised**
S.C. 1	3.41%	2.79%
S.C. 1C	10.28%	10.31%
S.C. 2 ND	7.54%	6.84%
S.C. 2 Dem	6.34%	6.47%
S.C. 3 Sec	6.73%	7.02%
S.C. 3 Pri	9.16%	11.56%
S.C. 3 Sub/Tran	1.90%	5.14%
S.C. 3-A Sec/Pri	6.06%	8.04%
S.C. 3-A Sub	4.36%	8.38%
S.C. 3-A Tran	0.10%	4.56%
S.C. L	9.96%	9.97%

Q PLEASE SUMMARIZE YOUR RECOMMENDATION REGARDING THE SERP'S PROPOSED ECOSS-HISTORIC.

A The Commission should reject the ECOSS-Historic in its entirety. Initially, inasmuch as the Commission uses a forecasted rate year to set rates, it would be consistent for it also to use a forecasted rate year for purposes of the ECOSS, revenue allocation and rate design. Although the SERP ECOSS-Historic seeks to avoid forecast error by relying upon historic revenues and costs, it creates an inconsistency – and violates the Matching Principle – by also relying on Rate Year customer, demand and energy allocators (which similarly are subject to forecast error just like revenues and costs). Additionally, as demonstrated above, the ECOSS-Historic produces distorted results, and, therefore, is not suitable for use in determining class revenue allocation. However, should the Commission disagree and rely on the ECOSS-Historic, it first should be corrected as I have recommended in my Direct Testimony.

3. STAFF GAS RATES PANEL

Q IS THE SGRP PROPOSING ANY CHANGES TO THE COMPANY'S GAS ECOSS?

A Yes. Although the SGRP generally agrees with the methodology in NiMo's ECOSS, it is proposing to change the percentage of gas distribution mains that are classified as customer-related. Specifically, the SGRP recommends that approximately 30% of gas distribution mains be classified as customer-related, while the remaining 70% be classified as demand-related.[4] NiMo, by contrast, is proposing to classify 45.5% of gas distribution mains as customer-related.[5]

Q IS THERE ANY DISAGREEMENT THAT SOME PORTION OF DISTRIBUTION MAINS SHOULD BE CLASSIFIED AS CUSTOMER-RELATED?

A No. Both NiMo and the SGRP used the Zero Intercept (ZI) method to determine the portion of distribution mains that should be classified as customer-related. For the reasons discussed later, NiMo's proposed classification should be adopted.

Q WHAT IS THE BASIS FOR THE SGRP'S RECOMMENDATION TO CLASSIFY APPROXIMATELY 30% OF DISTRIBUTION MAINS AS CUSTOMER-RELATED?

A The SGRP used different pipe sizes than NiMo in its ZI analyses, and it also used different trend lines to "fit" the data. As demonstrated below, in both instances the SGRP's approach is flawed and should be rejected.

Q WHAT IS THE ZERO INTERCEPT METHOD?

A The ZI method is a statistical tool that determines the installed cost of a "theoretical" zero-inch diameter pipe. A zero-inch pipe reflects the cost of connecting a natural

[4] *Direct Testimony of Staff Gas Rates Panel* at 13.

[5] *Direct Testimony of NiMo's Gas Rate Design Panel* at 18.

gas customer to the system, irrespective of the customer's peak day demand and gas usage. In other words, ZI determines that portion of the installed cost that is unrelated to the size of the customer. This cost is considered customer-related. The remaining investment, which is required to satisfy a customer's demands for gas service, is considered demand-related.

Q HOW DOES THE ZERO-INTERCEPT METHOD WORK?

A The starting point is an analysis of historical installed costs of the different types and sizes of pipe utilized to provide gas delivery service. NiMo uses three different types and sizes of pipe.

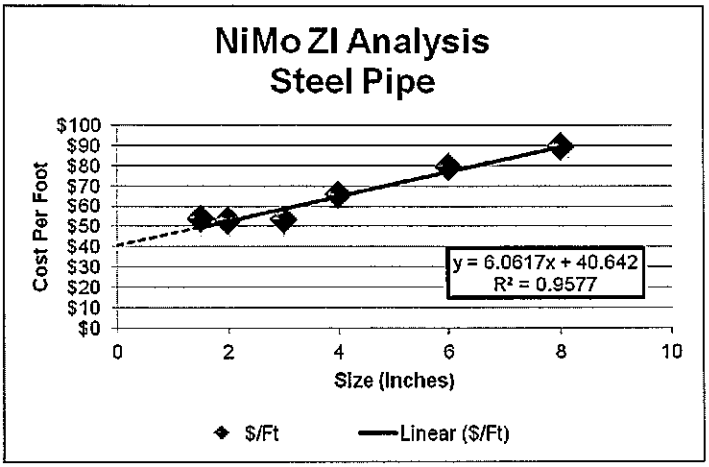
Table 3
NiMo Pipe Sizes by Type

Type	Diameter
Steel	1.5" to 24"
Plastic	1" to 12"
Cast Iron	1" to 16"

Pipe sizes range from 1 inch to 24 inches. The installed costs are adjusted to current dollars (NiMo used 2007 dollars), and a cost per foot is determined for each pipe size and type. The adjusted cost per foot is then plotted for each type and selected pipe sizes, and a trend line is developed to determine the costs per foot for a zero-inch pipe.

The process is illustrated in the chart below. As can be seen, the costs where the linear trend line intercepts the vertical axis (*i.e.*, at a zero inch diameter) is $40.64 per foot for steel pipe. The average cost of steel pipe is $84.03 per foot.[6] Thus, 48.37% ($40.64 ÷ $84.03) of the investment in steel pipe is customer-related.

[6] Exhibit___(JP-R3), line 1 column 3 ÷ column 2.



Q HOW DID THE SGRP DERIVE THE CUSTOMER-RELATED PORTION OF DISTRIBUTION MAINS?

A The SGRP conducted two separate ZI analyses. The first analysis (Staff 1) used the average installed cost for each selected pipe size. With the exception of the pipe sizes selected by SGRP, this analysis was similar to the Company's ZI analysis. The result of the Staff 1 analysis is to classify approximately 29.4% of distribution mains as customer-related.

The second analysis (Staff 2) was developed by using the weighted average cost per foot of specific groups of selected pipe sizes, rather than each individual pipe size. The Staff 2 analysis gives more weight to those pipe sizes that are more commonly installed. The result of the Staff 2 analysis was to classify approximately 32.6% of distribution mains as customer-related.

Based on the two analyses, Staff recommended classifying 30% of distribution mains as customer-related.

Q WHAT PIPE SIZES DID THE SGRP USE IN ITS ZI ANALYSIS?

A The specific size pipes used by the SGRP are shown in **Exhibit ____(JP-R2)**. The pipe sizes used by NiMo are shown for comparison. As can be seen, for steel pipe (lines 1-15), SGRP included all pipe over 8 inches in diameter but excluded pipe smaller than 2 inches. NiMo, by contrast, excluded pipe over 8 inches but included pipe as small as 1.5 inch. Similar judgments were made for plastic (lines 16-24) and cast iron (lines 25-31) pipes.

Q HAS THE SGRP PROVIDED ANY EXPLANATION FOR EXCLUDING PIPES SMALLER THAN 2 INCHES OR INCLUDING PIPES LARGER THAN 8 INCHES?

A No. The only explanation provided in the SGRP testimony was to note that:

> The results of our zero intercept analysis seem to be more reasonable...[7]

When asked in discovery why SGRP included more pipe sizes than did NiMo, the reply was:

> The overall goal was to exclude the least amount of raw data, in terms of Dollars and Quantity, as we could.[8]

Q IS SGRP'S EXCLUSION OF THE SMALLER MAINS REASONABLE?

A No. As can be seen in **Exhibit ___(JP-R2)**, NiMo considers the smaller size mains to be standard size equipment on its system. Further, as can be seen in the Table below, the average cost per foot for the smaller standard size mains is not out of line relative to the other standard sizes.

[7] *Direct Testimony of Staff Gas Rates Panel* at 13.

[8] DPS's Response to MI-1.

Table 4 Steel Pipe		
Diameter	Standard Equipment	Cost Per Foot
1.5	X	$53.60
2	X	$52.49
2.5		$47.62
3	X	$53.18
4	X	$65.13
5		$33.24
6	X	$78.92
8	X	$89.05

The only outliers in terms of cost per foot in the above table are the 2.5" and 5" diameter pipes. NiMo considers both sizes to be non-standard equipment. Despite this, the SGRP used both pipe sizes, while ignoring the standard 1.5" diameter pipe.

Q WHAT IS NIMO'S DEFINITION OF STANDARD SIZE PIPES?

A NiMo defines a standard size by the amount of installed pipe, as shown in the Table below:

Table 5 NiMo's Criteria For Identifying Standard Pipe Sizes	
Type	Minimum Installed Footage (Linear Ft.)
Steel	12,000
Plastic	2,000
Cast Iron	

Q IS SGRP'S DECISION TO INCLUDE NON-STANDARD SIZE PIPES REASONABLE?

A No. There is no justification for including any non-standard size pipes in analysis. As can be seen in Table 4, the costs of the 2.5" and 5" steel pipes are clearly outliers. Including outliers in the analysis will understate the customer-related cost.

Thus, the ZI should only reflect the standard size (*i.e.* commonly used) for each type of pipe. Non-standard pipe sizes should not be included.

Q HAVE YOU REVISED THE STAFF 1 ZI ANALYSIS USING ONLY STANDARD PIPE SIZES?

A Yes. **Exhibit ___(JP-R3)** shows the impact of using only standard pipe sizes in the Staff 1 ZI analysis. As can be seen, the analysis demonstrates that approximately 62% of distribution mains should be customer-related. Thus, once non-standard pipe sizes appropriately are removed from the calculations, the Staff 1 analysis demonstrates that NiMo's classification of 45% of gas distribution mains expense as customer-related is understated.

Q YOU ALSO STATED THAT THE SGRP USED DIFFERENT TYPES OF TREND LINES. WHAT DO YOU MEAN BY A TREND LINE?

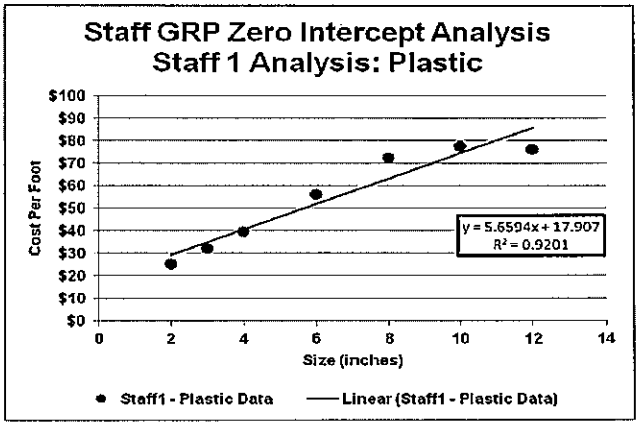
A In a ZI analysis, a trend line is "fitted" to the data and then extrapolated to the vertical (Y) axis, which represents that cost of a zero-inch distribution main. There are several ways that a trend line can be constructed. For example, NiMo used linear trend lines for the different types of pipe. A linear trend line is a straight line fitted to the data that is then extrapolated to the vertical access. The SGRP, on the other hand, used different trend lines for each type of pipe, as shown in the Table below:

Table 6
SGRP's Trend Lines

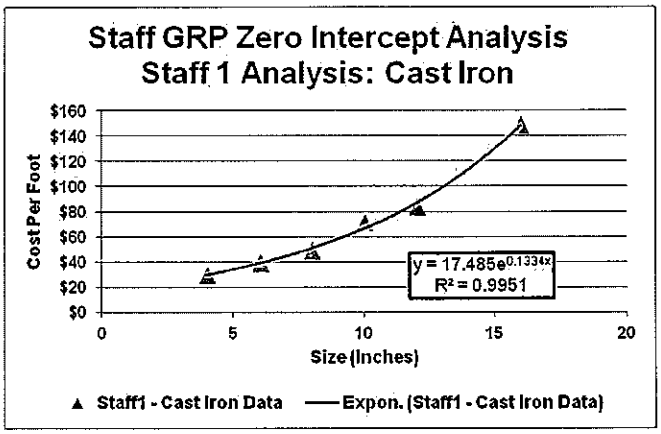
Type	Type
Steel	2nd Order Polynomial
Plastic	Linear
Cast Iron	Exponential

Q WHAT ARE THE DIFFERENCES BETWEEN LINEAR, EXPONENTIAL AND POLYNOMIAL TREND LINES?

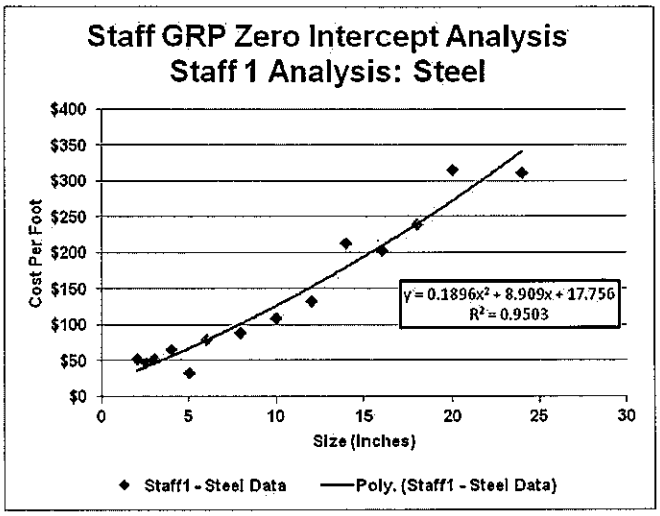
A A linear trend line assumes that the relationship between size and the installed cost can be explained by a straight line as illustrated in the chart below:



An exponential trend line assumes that the cost per foot varies exponentially with size, as illustrated in the following chart:



A polynomial trend line uses a curve as illustrated in the following chart:



Thus, a polynomial is a combination of one or more exponential terms and a linear term. The above polynomial trend line has one exponential and one linear term plus a constant. This is referred to as a "second order" polynomial. Polynomials can also use three or four multiple terms, which are referred to as "third" and "fourth" order polynomials.

Q WHY DID THE SGRP USE DIFFERENT TYPES OF TREND LINES?

A My analysis of the Staff 1 ZI analysis indicates that the use of different trend lines was the direct result of using a broader range of pipe sizes (including non-standard pipe sizes). In other words, if the SGRP had fitted a linear trend line to its much larger data set, the statistical relationship would not have been as strong as with other types of trend lines (*i.e.,* 2nd order polynomial and exponential). This is demonstrated in **Exhibit ___ (JP-R4)**.

Exhibit ___ (JP-R4) shows the R Squared value for linear trend lines (column 1), the SGRP's proposed trend lines (column 2) and the best fit trend lines (column 3) for each different type of pipe. A higher R Squared is one indication that the

statistical relationship may be stronger. As can be seen, the linear trend lines fitted to steel and cast iron pipes (lines 1 and 3) have a lower R Squared than for the corresponding non-linear trend lines that the SGRP used.

Q DO THE TYPES OF TREND LINES CHOSEN BY THE SGRP NECESSARILY PROVIDE THE BEST FIT?

A No, they do not. Using the same pipe sizes as the SGRP, we can increase the R Squared values by using 3rd and 4th order polynomials. This is shown in column 3, **Exhibit ___ (JP-R4)**. In other words, the SGRP could have used better fitting trend lines.

Q HOW WOULD THESE BETTER FITTING TREND LINES AFFECT THE RESULTS?

A As can be seen in **Exhibit ___(JP-R5)**, the better fitting trend lines would result in classifying approximately 57% of distribution mains investment as customer-related. Thus, for certain types of pipe, the SERP used different trend lines than NiMo, presumably to achieve a better fit. Significantly, however, using the best trend lines results in a classification of 57% of distribution mains investment as customer-related, almost twice what SERP recommended based, in large part, on less-than-optimal trend lines.

Q PLEASE SUMMARIZE YOUR CRITICISM OF THE SGRP'S ZI ANALYSIS.

A The SGRP's ZI analysis is flawed because it used larger, non-standard size pipes while excluding smaller, standard size pipes. Had the SGRP used only standard size pipes, it would have recommended classifying 44% of distribution mains as customer-related. Further, the SGRP's trend lines understate the statistical relationship between size and the cost per foot. Using the best-fitting trend lines

would have resulted in classifying up to 57% of mains as customer-related. These two refinements to SGRP's analysis, thus, support the reasonableness of the Company's proposal to classify 45% of distribution mains as customer-related. Accordingly the Commission should reject the SGRP's recommendations and adopt NiMo's position, which is not opposed by MI, on this issue.

4. CORRECTED MI-REVISED ECOSS-CU

Q DID YOUR ANALYSIS OF THE SERP'S ECOSS-HISTORIC REVEAL ANY OTHER CONCERNS?

A Yes. I recently found in error in reviewing the demand allocation factors used in the ECOSS-CU. The source of the error is an inconsistency in the derivation of the Rate Year 1CP and NCP demands used to allocate demand-related costs.

Q WHAT WAS THE INCONSISTENCY?

A NiMo derived the Rate Year 1CP and NCP demands by applying historical load factors to Rate Year kWh sales *at the meter.* The historical load factors were developed for three separate twelve-month periods, including the Test Year. The inconsistency was in the derivation of the Test Year load factor. Specifically, the Test Year load factor was based on the ratio of *loss-adjusted* kWh sales (that is, kWh *at the generator*) to loss-adjusted demand. However, the corresponding load factors for the other periods used kWh sales *at the meter.* This resulted in over-stating the three-year average load factor and slightly under-stating the Rate Year demands.

Q HAVE YOU CALLED THIS INCONSISTENCY TO NIMO'S ATTENTION?

A Yes.

Q WILL CORRECTING THE INCONSISTENCY CHANGE THE ECOSS RESULTS?

A Yes. **Exhibit ___(JP-R6)** is a corrected version of MI-Revised ECOSS-CU that was originally filed as **Exhibit ___(JP-3)** of my Direct Testimony. As can be seen in the table below, correcting the Test Year load factor changes the earned RORs by between 6 and 28 basis points.

Table 7: Impact of Correcting the Test Year Load Factor on MI's Revised ECOSS		
Rate Class	**Original**	**Corrected**
S.C. 1	3.90%	3.89%
S.C. 1C	10.41%	10.35%
S.C. 2 ND	7.99%	7.97%
S.C. 2 Dem	7.09%	7.04%
S.C. 3 Sec	7.51%	7.47%
S.C. 3 Pri	8.78%	8.92%
S.C. 3 Sub/Tran	7.32%	7.53%
S.C. 3-A Sec/Pri	6.17%	6.24%
S.C. 3-A Sub	8.09%	8.23%
S.C. 3-A Tran	6.41%	6.69%
S.C. L	11.13%	11.12%

Q DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A Yes.

NIAGARA MOHAWK POWER CORPORATION
Analysis of the ECOSS-Historic

Line	Description	Residential SC-1	Resid. TOU SC-1C	Small Gen No Dem SC-2-ND	Small Gen Demand SC-2-Dem	Large Gen. Sec. SC-3-Sec	Large Gen. Pri. SC-3-Pri	Large Gen. Tran. SC-3-Sub/Tran	Lg. Gen. TOU-Sec./Pri. SC-3A-S/P	Lg. Gen. TOU-Sub. SC-3A-Sub	Lg. Gen. TOU-Tran. SC-3A-Tran	Lighting SC-L
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Delivery Revenues Net of Discounts ($000)											
1	ECOSS-CU	$735,654	$12,401	$58,506	$163,325	$113,086	$38,413	$5,468	$23,599	$13,474	$37,955	$49,077
2	ECOSS-Historic	$739,038	$12,754	$55,813	$162,748	$114,024	$40,216	$4,796	$22,239	$12,341	$33,295	$48,578
3	Difference	0.5%	2.8%	-4.8%	-0.4%	0.8%	4.5%	-14.0%	-6.1%	-9.2%	-14.0%	-1.0%
	Energy Allocation Factor											
4	Rate Year	33.7%	1.1%	1.9%	13.2%	13.1%	6.1%	1.8%	4.0%	5.5%	19.0%	0.6%
5	Test Year	33.6%	1.1%	1.9%	12.9%	13.0%	6.5%	3.7%	3.8%	5.3%	17.8%	0.6%
6	Difference	-0.4%	-3.0%	-1.7%	-2.9%	-0.6%	5.3%	50.9%	-3.1%	-3.9%	-6.9%	-2.8%
	1CP Demand Allocation Factor											
7	Rate Year	42.7%	1.0%	2.7%	14.6%	13.0%	5.1%	1.3%	3.2%	4.1%	12.4%	0.0%
8	Test Year	44.8%	1.0%	2.6%	14.2%	13.0%	5.4%	2.6%	3.1%	3.9%	11.6%	0.0%
9	Difference	4.8%	-2.8%	-1.5%	-2.8%	-0.4%	5.4%	51.0%	-3.0%	-3.8%	-6.8%	-2.6%
	Primary NCP Demand Allocation Factor											
10	Rate Year	53.1%	1.2%	3.1%	16.1%	15.8%	6.3%		3.5%			0.9%
11	Test Year	51.2%	1.3%	3.1%	17.4%	16.1%	6.1%	N/A	3.8%	N/A	N/A	1.0%
12	Difference	-3.7%	11.7%	-1.7%	7.2%	1.9%	-2.6%		7.9%			6.5%
13	**Impact on Rate of Return Per Dollar Change In Revenues**	0.10	0.69	-1.18	-0.08	0.16	0.97	-1.29	-1.26	-1.64	-2.30	-0.26

NIAGARA MOHAWK POWER CORPORATION
d/b/a NATIONAL GRID
Pipe Sizes Included in the Zero Intercept Analysis

Line	Diameter (Inch)	Standard Size	NiMo	Staff
	(1)	(2)	(3)	(4)
	Steel Pipe			
1	1.5	Yes	X	
2	2	Yes	X	X
3	2.5	No		X
4	3	Yes	X	X
5	4	Yes	X	X
6	5	No		X
7	6	Yes	X	X
8	8	Yes	X	X
9	10	Yes		X
10	12	Yes		X
11	14	No		X
12	16	Yes		X
13	18	No		X
14	20	Yes		X
15	24	No		X
	Plastic Pipe			
16	1	Yes	X	
17	1.75	Yes	X	
18	2	Yes	X	X
19	3	Yes	X	X
20	4	Yes	X	X
21	6	Yes	X	X
22	8	Yes	X	X
23	10	No		X
24	12	Yes		X
	Cast Iron Pipe			
25	1	Yes	X	
26	4	Yes	X	X
27	6	Yes	X	X
28	8	Yes	X	X
29	10	Yes		X
30	12	Yes		X
31	16	Yes		X

NIAGARA MOHAWK POWER CORPORATION
d/b/a NATIONAL GRID
Staff 1 Zero Intercept Analysis
Adjusted to Eliminate Non-Standard Size Pipe

Line	Pipe Type	Zero Intercept	Total Footage	Total 2007 Cost	Zero Inch Cost	% Customer Related
		(1)	(2)	(3)	(4)	(5)
1	Steel	$59.21	20,011,163	$1,681,506,420	$1,184,760,905	70.46%
2	Plastic	$18.49	19,993,230	$794,837,329	$369,734,802	46.52%
3	Cast Iron	$17.49	3,143,704	$136,785,151	$54,967,664	40.19%
4	Total		43,148,097	$2,613,128,899	$1,609,463,372	**61.59%**
5					**% Demand-Related**	**38.41%**

NIAGARA MOHAWK POWER CORPORATION
d/b/a NATIONAL GRID
Comparison of R Squared Values Under Staff 1 Analysis
Linear vs Staff Proposed Trend Lines

Line	Pipe Type	Linear	Staff Proposed	Best Fit
		(1)	(2)	(3)
1	Steel	0.9436	0.9503	0.9731
2	Plastic	0.9201	0.9201	0.9990
3	Cast Iron	0.9383	0.9951	0.9960

NIAGARA MOHAWK POWER CORPORATION
d/b/a NATIONAL GRID
Staff GRP Zero Intercept Analysis
Adjusted to Best Fit Trendlines

Line	Pipe Type	Zero Intercept	Total Footage	Total 2007 Cost	Zero Inch Cost	% Customer Related
		(1)	(2)	(3)	(4)	(5)
1	Steel	$48.67	20,011,163	$1,681,506,420	$973,943,303	57.92%
2	Plastic	$23.79	19,993,230	$794,837,329	$475,638,942	59.84%
3	Cast Iron	$10.99	3,143,704	$136,785,151	$34,543,020	25.25%
4	Total		43,148,097	$2,613,128,899	$1,484,125,264	**56.79%**

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Summary of MI's Revised Electric ECOSS-CU at Present Rates Corrected
Rate Year Ending March 31, 2014
(Dollar Amounts In Thousands)

Line	Description	Total	Residential	Resid. TOU	Small Gen No Dem	Small Gen Demand	Large Gen-Sec	Large Gen-Pri	Large Gen-Tran	Lge Gen TOU-S/P	Lge Gen TOU-SubT	Lge Gen TOU-Tran	Lighting
			SC-1	SC-1C	SC-2-ND	SC-2-Dem	SC-3-S	SC-3-P	SC-3-T	SC-3A-S/P	SC-3A-U	SC-3A-S/T	SC-L
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Present Distribution revenue	$1,296,992	$768,017	$13,192	$60,272	$167,420	$115,780	$39,317	$5,658	$24,178	$13,871	$39,432	$49,856
2	Forfeited discounts	$11,930	$8,664	$91	$552	$1,592	$667	$217	$20	$72	$21	$34	$0
3	Other revenue	$110,650	$51,022	$1,197	$3,324	$15,311	$13,757	$5,272	$1,291	$3,276	$4,089	$12,356	-$247
4	Total Operating Revenue	$1,419,572	$827,704	$14,480	$64,148	$184,322	$130,205	$44,806	$6,969	$27,526	$17,982	$51,822	$49,609
5	Operating Expenses	$1,203,738	$736,556	$10,646	$51,358	$147,744	$102,561	$34,596	$5,519	$22,274	$13,999	$42,158	$36,327
6	Net income	$215,834	$91,148	$3,834	$12,790	$36,579	$27,644	$10,209	$1,450	$5,252	$3,983	$9,664	$13,281
7	Rate Base	$3,962,086	$2,344,578	$37,048	$160,483	$519,652	$370,175	$114,451	$19,266	$84,135	$48,399	$144,469	$119,428
8	Return on Rate Base	5.45%	3.89%	10.35%	7.97%	7.04%	7.47%	8.92%	7.53%	6.24%	8.23%	6.69%	11.12%
9	Relative Rate of Return	1.00	0.71	1.90	1.46	1.29	1.37	1.64	1.38	1.15	1.51	1.23	2.04
10	Subsidy	(7)	($60,747)	$3,005	$6,652	$13,804	$12,440	$6,658	$664	$1,108	$2,230	$2,971	$11,208