BEFORE THE

WASHINGTON UTILITIES & TRANSPORTATION COMMISSION

UG-__

GENERAL RATE APPLICATION

OF

NORTHWEST NATURAL GAS COMPANY

MARCH 28, 2008

Direct Testimony of David A. Heintz:

Cost of Service Study

DIRECT TESTIMONY OF DAVID H. HEINTZ

Cost of Service Study

Table of Contents

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

I. Introduction and Summary

Q. Please state your name, occupation, and business address.

A. My name is David A. Heintz. My business address is 293 Boston Post Road West, Suite 500, Marlborough, MA 01752. I am an Assistant Vice President with Concentric Energy Advisors, Inc. ("Concentric"). Concentric is a management consulting and economic advisory firm focused on the North American energy and water industries. Concentric specializes in transaction-related financial advisory services, energy market strategies, market assessments, regulatory and litigation support, energy commodity contracting and procurement, economic feasibility studies, and capital market analyses and negotiations.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of Northwest Natural Gas Company (NW Natural or the Company).

Q. Have you testified before regulatory authorities in the past?

A. Yes. I have testified before the Federal Energy Regulatory Commission in Texas Eastern Transmission Corporation, Docket No. CP81-237, and Panhandle Eastern Pipeline Corporation, Docket No. RP82-58. I have also testified before the New York State Public Service Commission in Empire Pipeline, Case No. 88-T-132, the Massachusetts Department of Telecommunications and Energy in Boston Gas Company, Docket No. 96-50, the Pennsylvania Public Utility Commission in Peoples Natural Gas Company, Docket No. R-00994600, the New Jersey Board of Public Utilities in South Jersey Gas Company, Docket No.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

GX99030121 and GO99030124, the State of Rhode Island and Providence Plantation Public Utilities Commission, New England Division Southern Union Company, Docket No. 3401, and the Arkansas Public Service Commission in Arkansas Oklahoma Gas Corporation, Docket No. 05-006.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to explain and support the Cost of Service Study ("COSS"), and the allocation of the revenue deficiency to the various rate schedules.

II. Cost of Service Study

Q. What is the purpose of a COSS?

A. A COSS provides a measure of the cost responsibility of the Company's various rate classes (or schedules) based on cost causation principles. In general, costs are first identified based on the function for which they are incurred, then those costs are classified among customer, demand and commodity classifications, and finally directly assigned or allocated to the various classes (schedules). An allocated cost of service study is necessary in certain instances to arrive at the cost responsibility for individual rate schedules because many of the Company's costs are common and are incurred across all classes of customers.

Identification of the costs caused by each rate schedule provides a guide for the allocation of the revenue requirement increase to each rate schedule and for the design of rates to achieve the assigned revenue responsibility.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

Q. What are the guiding principles that should be followed when performing a cost of service study?

A. The concept of *cost causation* is the fundamental and underlying philosophy applicable to all cost studies performed for the purpose of allocating costs to customer groups. Cost causation addresses the question: "Which customer or group of customers causes the utility to incur particular types of costs?" To answer this question, it is necessary to establish a linkage between a utility's customers and the particular costs incurred by the utility in serving those customers.

The essential element in the selection and development of a reasonable cost of service study allocation methodology is the establishment of relationships between customer requirements, load profiles, and usage characteristics on the one hand and the costs incurred by the utility in serving those requirements on the other hand. For example, providing a customer with gas service during peak periods can have much different cost implications for the utility than service to a customer who requires off-peak gas service.

Q. Why are the relationships between customer requirements, load profiles and usage characteristics significant to cost causation?

A. The distribution system is designed to meet three primary objectives: (1) to extend distribution services to all customers entitled to be attached to the system; (2) to meet the aggregate peak design day capacity requirements of all customers entitled to service on the peak day; and (3) to deliver volumes of

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

natural gas to those customers. There are certain costs associated with each of these objectives. Also, there is generally a direct link between the manner in which such costs are defined and their subsequent allocation.

Customer-related costs are incurred to attach a customer to the distribution system, meter any gas usage, and maintain the customer's account. Customer costs are a function of the number of customers served and continue to be incurred whether or not the customer uses any gas. They may include capital costs associated with services, meters, regulators, and customer billing and accounting expenses.

Demand- or *capacity*- related costs are associated with plant that is designed, installed and operated to meet maximum hourly or daily gas flow requirements, such as transmission and distribution mains, or more localized distribution facilities which are designed to satisfy individual customer maximum demands. Gas supply contracts also can have a capacity-related component of cost relative to the company's requirements for serving daily peak demands and the winter peaking season.

Commodity-related costs are those costs that vary with the throughput sold to, or transported for, customers. Costs related to gas supply are classified as commodity related to the extent they vary with the amount of gas volumes purchased by the utility for its sales service customers.

Q. Please describe the process used in performing the COSS.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

A. As noted above, the cost of service study is a basic three-step analysis process that is facilitated by a computer cost study model. The steps are:

<u>Functionalization</u> – Plant investment costs and operating costs are categorized by the operational functions with which they are associated, *e.g.,* production, storage, gas supply, and distribution.

<u>Classification</u> – The functional cost elements are classified by the factor of utilization most closely matching the cost causation. These are primarily demand, commodity, and customer classifications.

<u>Allocation</u> – The functionalized, classified costs are allocated to the rate schedules by allocation factors. Allocation factors are generally based upon volumetric usage, demand usage, or the number of customers for each rate schedule or special studies to determine cost causation.

Q. What costs have been used to develop the COSS?

A. The COSS in this proceeding is based on the pro forma costs of NW Natural, as presented in the joint testimony of Mr. Kevin S. McVay and Ms. Natasha C. Siores. As explained in Mr. McVay and Ms. Siores' testimony, these costs are based on the twelve months ending September 2007, as adjusted. *See, Exhibit No.___ (KSM/NCS-1).* The sales, customer and revenue data underlying the adjusted costs were used as the allocation bases for several accounts. The remaining allocation data sources were derived from special studies, based on data supplied by the Company.

Q. What customer rate schedules are evaluated in the COSS?

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

A. There are six customer rate schedules evaluated in the COSS: They are:

Rate Schedule	Description
01	General Sales Service
02	Residential Sales Service
03	Basic Firm Sales Service
27	Residential Heating Dry Out
41	Non-Residential Sales & Transport Service
42	Large Volume Non-Residential Sales & Transport Service

As part of this filing, NW Natural proposes to eliminate Rate Schedule 21, "Firm Service High Load Factor", and move the customers on Rate Schedule 21 to either Rate Schedule 3 or Rate Schedule 41, whichever is the better economical match for the customer. This migration is more fully discussed later in my testimony. In addition to these rate schedules, the COSS includes the revenues from Special Contracts ("Contracts") as credits to the cost of service. The distribution revenues from these Contracts are treated as credits since the nature of the Contracts do not allow for general rate increases. For purposes of this study, the revenues and volumes related to Rate Schedule 19 have been included with the residential service class.

Q. Once the costs are identified by function, how are the costs classified for the COSS?

A. Costs are classified into the demand, customer, and commodity classifications described earlier in my testimony, on an account-by-account basis consistent with the manner in which the costs are incurred. In addition, there are a number

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

of costs that are classified based on a composite of the foregoing demand, customer, and commodity classifications.

Q. Once the costs are functionalized and classified, how are the costs allocated in the COSS?

A. Costs are allocated to the rate schedules on the basis of each rate schedule's responsibility for the costs being incurred. The development of appropriate allocation factors is a critical component of the allocation process and is based on (1) direct assignment where the cost causation is known; (2) rate schedule summary statistics, *e.g.,* number of customers and throughput by rate schedule; (3) special studies used to determine cost causation and thus responsibility for each schedule; and, (4) allocation factors based on composites of the primary allocation results.

Q. Is the overall allocation approach utilized in this proceeding consistent with that utilized by the Company in previous rate proceedings?

A. Yes. The overall allocation approach is similar to that used in the prior case, UG-031885.

Q. Does the COSS include purchased gas costs?

A. Exhibit No.___ (DAH-3) provides the summary results of the COSS including gas costs; however, this is for informational purposes only as the Company is not proposing any changes in either the level of gas costs or the allocation of gas costs to customers.

Q. How are the costs of mains allocated to the respective rate schedules?

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

A. Primary mains, those 4 inches and larger, are allocated using a peak and average day factor to all rate schedules. The peak and average day factor is a composite factor made up of peak day throughput and average day throughput.

Average daily volume divided by peak day volume provides the system average load factor which is 26.16 percent in this case. This share of primary main costs is allocated to rate schedules on the basis of annual volumes, while the remaining primary main costs are allocated to the rate schedules on the basis of peak day volumes.

Average day is defined as normalized throughput divided by 365. Peak day throughput is based on the higher of a design peak day or the average of the rate schedule's peak month consumption. A design day was based on the system design three-day peak calculated based on use per customer factors from NW Natural's draft 2008 Integrated Resource Plan[1] for all classes except Rate Schedules 21 and 42. For these schedules, it was necessary to use an average of the schedule's peak month consumption as the design day calculation produced load factors in excess of 1.00.

Secondary mains, those up to 4 inches, are allocated in a similar fashion. The difference is that Rate Schedule 42 and Special Contract volumes are excluded from the allocation as these large customers do not use the Company's small distribution mains.

1 NW Natural filed its 2007 Integrated Resource Plan (IRP) in Washington in March 2007. An updated IRP will be filed in Washington and Oregon in April 2008. A draft of the revised plan was distributed to Washington staff on February 7, 2008.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

Q. Why did the Company use its design day demand rather than its actual peak day demand as a demand allocation factor?

A. Use of the Company's design day demand is superior to using its actual peak day demand or an historical average of multiple peak day demands over time for purposes of deriving demand allocation factors for a number of reasons. These include:

- NW Natural's gas system is designed, and consequently costs are incurred, to meet design day demand. In contrast, costs are not incurred on the basis of average of peak demands.
- Design day demand is more consistent with the level of change in customer demands for gas during peak periods and is more closely related to the change in fixed plant investment over time.
- Design day demand provides more stable cost allocation results over time.

Q. Please explain why the Company's design day demand best reflects the factors that actually cause costs to be incurred.

A. The Company relies upon design day demand in acquiring upstream gas supply-related resources and in designing its distribution facilities required to service firm service customers. Perhaps more importantly, design day demand directly measures the gas demand requirements of the Company's firm service customers which create the need for the Company to acquire resources, build facilities and incur millions of dollars in fixed costs on an ongoing basis.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

The development of NW Natural's gas planning standard is discussed in its draft 2008 Integrated Resource Plan. With regard to delivery system planning, guidelines are established for installation, maintenance, and operation of the Company's physical plant in order to balance cost, safety, and operational requirements. Because of the Company's reliance on its design day planning standard in the acquisition of upstream supply and capacity resources and in its distribution system planning and design criteria, the true cost causative factors of the Company's operations are captured by utilizing the design peak day requirements within its cost of service studies.

Q. Please explain why use of design day demand provides more stable cost allocation results over time.

A. By definition, the Company's design day peak is as stable a determinant of planned capacity utilization as can be derived. If it were not a stable demand determinant, the design of NW Natural's gas system and supply portfolio would tend to vary and make the installation of facilities and acquisition of supply resources and capacity a much more difficult task. Therefore, use of design day demands provides a more stable basis than any of the other demand allocation factors available based on either actual peak day demand or the averaging of multiple peak days.

Q. How are meter costs allocated?

A. Meter costs, including encoder receiver transmitters ("ERT") and installation costs, are allocated on the basis of a study of actual costs by rate schedule. The

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

Company provided data on meter types and meter counts by rate schedule and a listing of replacement costs by meter type. This information was used to produce a total cost by rate schedule that was used to allocate meter plant costs.

Q. How are service costs allocated?

A. The Company provided an average service line cost (*i.e*. the cost of installing the pipe that connects the customer's meter to the distribution main) for residential and small commercial customers. The cost was applied to the number of residential and small commercial customers to obtain the service line costs for these customers. The remaining service line costs are then allocated to the remaining rate schedules using the meter allocator. In the absence of specific cost data on service lines for the larger customer classes, meter costs were used as a proxy for the allocation of the cost of service lines. The Company's experience with the installation of metering facilities and service lines for these larger customers has led to the conclusion that the larger meter installations require correspondingly larger sized service lines to supply the required volume of gas.

Q. How are storage costs allocated?

A. Storage provides the system with gas during the heating season. Because of the seasonal nature of the service provided, the costs are allocated on the basis of seasonal loads. Commodity specific costs, reservoirs and non-recoverable gas plant and expenses, are allocated on the basis of seasonal sales load. The

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

other plant and expense items are allocated on the basis of incremental seasonal load which is the seasonal load less the average non-seasonal load.

Q. How are distribution expenses allocated?

A. Distribution expenses are, for the most part, allocated on the same basis as the related plant. For example, mains and services expenses are allocated on an internal factor which combines the allocation of the mains and services plant. Overhead expense accounts, such as supervision, engineering, and miscellaneous expense, are allocated on a labor or plant basis as appropriate.

Q. What factors are used for the allocation of customer accounts, meter reading and uncollectibles?

A. Customer records and collection expenses are allocated on a per customer basis. Meter reading costs are allocated on the basis of the number of meters. Uncollectible expenses are allocated on the basis of net write-offs by rate schedule.

Q. How are Administrative and General ("A&G") expenses allocated?

A. A&G expenses are allocated on the basis of labor, plant or O&M expenses as appropriate to reflect the underlying nature of the administrative cost category. A labor allocator is used for the allocation of outside services, pensions and benefits and injuries and damages. A plant allocator is used for the allocation of property insurance and maintenance of general plant. Regulatory commission expense is allocated on the basis of revenues and the remaining accounts are allocated on the basis of O&M expenses.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

Q. Please explain how the high load factor sales service, Rate Schedule 21, was treated in the cost of service study?

A. The settlement of NW Natural's prior Washington general rate case, WUTC Docket UG-031885, resulted in the closing of Rate Schedule 21 to new customers. It was the intent of the Company to migrate the existing Rate Schedule 21 customers to Rate Schedule 3 or Rate Schedule 41 over time. However, there has been little, if any, rate schedule migration due to the higher rates on Rate Schedules 3 and 41. In this filing, the Company proposes to complete the customer migration from Rate Schedule 21, terminate that Rate Schedule, and transfer the customers to Rate Schedules 3 or 41.

Q. Please explain how Rate Schedule 21 customers were moved to Rate Schedules 3 or 41?

A. This was a two-step process. First, all Rate Schedule 21 customers were included in the Rate Schedule 41 and an initial cost of service and rate allocation was made. Next, the Rate Schedule 21 customers were priced at the resulting Rate Schedule 3 and Rate Schedule 41 rates to determine which rate schedule was more favorable for the customer from a distribution margin perspective. Based on this analysis, 83 Rate Schedule 21 customers with annual usage less than 21,000 therms were found to be better off, *i.e.* have lower distribution bills, under Rate Schedule 3 than under Rate Schedule 41. The rate schedules were then reconfigured for this migration, the allocators were recalculated, and a second cost of service analysis and rate design was performed.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

Q. What changes in the rate schedule structures resulted from the proposed migration?

A. Table 1 below summarizes the rate schedule characteristics before migration and Table 2 summarizes the rate schedule characteristics after the proposed migration.

Table 1 – Pre-Migration

Rate Class	No. Customers	Annual Use (Dt)	Avg. Use/Customer	Rate of Return	Customer Costs
3	4,850	1,429,955	295	8.95%	$39.75
21	173	481,301	2,782	8.65%	$273.03
41	2	10,347	5,174	11.85%	$404.97

Table 2 – Post-Migration

Rate Class	No. Customers	Annual Use (Dt)	Avg. Use/Customer	Rate of Return	Customer Costs
3	4,933	1,602,081	325	8.81%	$42.74
21					
41	92	382,522	4,158	10.28%	$274.41

The returns of all three rate schedule were above the system average, 6.58 percent, before migration and remained so after migration. The lower returns in each case indicate the dilutive effect of adding customers. Rate Schedule 3 unit customer cost rose slightly while the Rate Schedule 41 unit costs dropped to the level of Rate Schedule 21 before migration. This indicates that the customers transferred to Rate Schedule 3 have somewhat larger meter and service line costs than the schedule average, as indicated by the usage per customer. The drop in the Rate Schedule 41 customer costs is a reflection of the small number

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

of customers (i.e., two) in that schedule prior to migration. Overall, it appears that the customers transferring to Rate Schedule 3 are slightly larger, on average, than the existing customers while those transferring to Rate Schedule 41 are somewhat smaller than the existing two customers.

Q. What total gas revenue requirement is the company utilizing in its proposal?

A. The Company has used a total revenue requirement of $95.8 million as shown on Exhibit No. ___ (DAH-3, page 1, line 21), including gas costs. The distribution revenue requirement is $35.9 million exclusive of gas costs as shown on Exhibit No.___ (DAH-2, page 1, line 21). Net of miscellaneous other revenue of $0.6 million the total Rate Schedule Revenue Requirement is $95.2 million (Exhibit No. ___ (DAH-3, page 1, line 23) and the non-gas Rate Schedule Revenue Requirement is $35.2 million (Exhibit No.____ (DAH-2, page 1, line 23).

Q. Have the results of the COSS been used in establishing the schedule-by-schedule revenue responsibility levels?

A. Yes. The schedule-by-schedule revenue responsibility levels at the Company's proposed revenue requirement and at equalized rates of return are shown on page 1, lines 34 and 21, respectively of Exhibits No.___ (DAH-2) and (DAH-3).

Q. Please describe the results of your COSS with respect to rate of return by rate schedule.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

A. Exhibit No. _____ (DAH-2, page 1), presents the summary results of the COSS at present and proposed rates. As shown on line 15 of this exhibit, at present rates the COSS shows a wide variation in the rates of return by rate schedule. The General and Residential Dry-Out services are well below NW Natural's overall rate of return of 6.58 percent and are in fact negative. The Residential Sales service shows a return of 5.4 percent while the returns of the other rate schedules are above the system average rate of return.

Q. Please describe the approach followed to apportion the proposed revenue deficiency of $4,342,062 to the Company's various rate schedules.

A. As described in Mr. Amen's Testimony, the allocation of revenues among rate schedules consists of deriving a reasonable balance between various guidelines and criteria that relate to the design of utility rates. *See, Exhibit No.___ (RJA-1).* The following criteria were considered in this process: (1) cost of service results, (2) class contribution to present revenue levels, (3) customer impacts, and (4) the Company's belief that all rate schedules should participate in the recovery of the overall revenue deficiency. After evaluating these criteria for each of the Company's rate schedules, adjustments were made to revenue levels so as to reduce the variation in the level of returns by schedule and move closer to uniform returns by schedule.

Q. How does NW Natural propose to distribute the revenue increase among the rate schedules?

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

A. Exhibit No.___ (DAH-4) shows the proposed distribution of the revenue increase among the rate schedules. Overall the Company is proposing to increase distribution revenues $4.3 million, or 14.1 percent. The returns for Rate Schedules 41, 42, and 3 are currently above the system average return of 6.58%, and have therefore been assigned less than the average increase. Rate Schedule 41 and 42 have been assigned the lowest level of increase, 6.7 percent, as these schedules currently have the highest returns. Rate Schedules 3 has been assigned an increases of 7.7 percent in recognition of its higher than average return. The 5.4 percent return on Rate Schedule 2, Residential Sales Service, is below the system average and has been assigned 125 percent of the system average increase. Rate Schedules 1 and 27 returns are well below the system average and have been assigned higher than average increases. Rate Schedule1 has been assigned 150 percent of the system average increase, and Rate Schedule 27 has been assigned 170 percent of the system average increase. Rate Schedule 19, Gas Light Service, was assigned the system average increase of 14.1 percent.

As shown on Exhibit No. ____ (DAH-2 page 1, line 37), these proposed increases have improved the revenue to cost ratio for all schedules, *i.e*. all rate schedules have been brought closer to the cost levels indicated in the cost of service study.

Q. Please describe the results of your COSS with respect to classified costs.

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211

A. The COSS summarized the costs allocated to the rate schedules on a classified basis, *i.e*. by demand, customer and commodity basis. Of particular interest are the customer-related costs. Exhibit No. ____ (DAH-2, page 3) provides a summary of the classified costs and page 4 shows these on a unit rate basis. These results were used by Company witness Amen as a guide in developing the customer charges for each rate schedule.

V. Qualifications

Q. Please describe your educational and professional background.

A. Please *see Exhibit No.___ (DAH-5).*

Q. Does this conclude your direct testimony?

A. Yes, it does.

///

Rates & Regulatory Affairs
NW NATURAL
220 N.W. Second Avenue
Portland, Oregon 97209-3991
1-503-226-4211