EXHIBIT

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| **Exhibit No.:** | _____ |
| **Issue(s):** | Mains Allocators; Rate Design |
| **Witness/Type of Exhibit:** | Hong Hu/Direct |
| **Sponsoring Party:** | Public Counsel |
| **Case No.:** | GR-2001-292 |

# DIRECT TESTIMONY

# OF

# HONG HU

Submitted on Behalf of the Office of the Public Counsel

**MISSOURI GAS ENERGY**

**Case No. GR-2001-292**

April 26, 2001

_____ Exhibit No. 109
Date 6-22-01 Case No. GR-2001-292
Reporter SW

**BEFORE THE PUBLIC SERVICE COMMISSION**
**OF THE STATE OF MISSOURI**

| | | |
|---|---|---|
| In the matter of tariff revisions of Missouri Gas Energy, a division of Southern Union Company, designed to increase rates for natural gas service to customers in the Missouri service area of the company. | ) ) ) ) | Case No. GR-2001-292 |

## AFFIDAVIT OF HONG HU

STATE OF MISSOURI )
) ss
COUNTY OF COLE )

Hong Hu, of lawful age and being first duly sworn, deposes and states:

1. My name is Hong Hu. I am a Public Utility Economist for the Office of the Public Counsel.

2. Attached hereto and made a part hereof for all purposes is my direct testimony consisting of pages 1 through 22 and Schedules DIR HH-1 and DIR HH-2.

3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge and belief.

**Hong Hu**

Subscribed and sworn to me this 26th day of April, 2001.

Bonnie S. Howard, Notary Public

My commission expires May 3, 2001.

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# DIRECT TESTIMONY
# OF
# HONG HU

## MISSOURI GAS ENERGY COMPANY

## CASE NO. GR-2001-292

**Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.**

A. Hong Hu, Public Utility Economist, Office of the Public Counsel, P. O. Box 7800, Jefferson City, Missouri 65102.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND EMPLOYMENT BACKGROUND.**

A. I hold a Bachelor of Engineering degree in Management of Information Systems from Tsinghua University of Beijing, China and a Masters of Arts degree in Economics from Northeastern University. I have completed the comprehensive exams for a Ph.D. in Economics from the University of Missouri at Columbia. I have been employed as a regulatory economist with the Office of Public Counsel (OPC) since March 1997.

**Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THIS COMMISSION?**

A. Yes. I have testified in numerous cases before this commission.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

A. The purpose of my direct testimony is to present the OPC's development of allocation factors for distribution mains for use in the class cost of service study

prepared by OPC witness James Busch. I will also discuss the details of OPC's rate design recommendation.

## I. ALLOCATION OF DISTRIBUTION MAINS COST

**Q. WHY IS THE ALLOCATION OF MAINS COST AN IMPORTANT ASPECT OF CLASS COST OF SERVICE STUDIES?**

A. In order to design customer rates for a utility company, class cost of service (CCOS) studies are commonly conducted in order to apportion total costs to the various customer classes in a manner consistent with the incurrence of those costs. In a CCOS study, mains cost allocation is very important because the cost of transmission and distribution mains accounts for a large part of the total system cost. Different methodology for allocating mains cost in a CCOS study will likely lead to different customer class revenue responsibility results. On the other hand, the allocation of mains cost has been a very controversial issue. Different parties to a case prefer different mains allocation methods and thus the parties' results vary widely from each other.

**Q. WHY ARE THERE LARGE DISCREPENCIES IN THE ALLOCATION OF MAINS COST?**

A. The existence of the large discrepancies in the allocation of mains cost is rooted in the characteristics of the main systems - Mains cost is a shared cost. The Company's investment in mains provides the Company with the means to deliver the gas to locations of all customer classes in response to customers' year-round demands for natural gas or have it available to back up other fuel sources. All customers benefit from the existence of mains on every day that they use gas.

The total costs of mains in a utility are much less than the sum of stand-alone costs of mains would be if one system of mains were used by one customer or one customer class separately.

It cannot be disputed that since all customers benefit from the existence of the mains system, all customers should contribute to the recovery of the cost of this mains system. Economic theory states that if each customer or class of customers is responsible for at least the incremental cost that this customer brings to the system, and that if no customer or class of customers is responsible for more than the stand alone cost that would be needed to serve this customer individually, then there is no cross-subsidy and the allocation of cost can be acceptable. However, both the incremental cost and the stand-alone cost of each customer class are hard to measure or determine. To accurately pinpoint cost responsibility of each specific customer class is inherently impossible.

**Q. PLEASE EXPLAIN THE CONTROVERSIES REGARDING DIFFERENT MAINS COST ALLOCATION METHODS.**

A. There are two primary controversies arising from different mains cost allocation methods. The first controversy is in the classification step of a CCOS study. Some people believe that a portion of mains cost should be classified as customer-related and other do not. The second controversy is in the allocation step of a CCOS study. Different experts advocate different methods of allocating the capacity-related mains cost.

**Q. PLEASE EXPLAIN THE FIRST CONTROVERSY IN MAINS COST ALLOCATION.**

A. In a CCOS study, costs can be classified as customer-related, capacity or demand-related, and energy or commodity-related. It is commonly agreed that at least a portion of the distribution mains systems should be classified as demand-related since some portion is related to maximum system requirements which the system is designed to serve during short intervals and does not directly vary with the number of customers or their annual usage. However, some people argue that a portion of the costs associated with the distribution system may be classified as customer-related costs. One argument for inclusion of part of distribution mains in the customer cost classification is that there is a zero or minimum size main necessary to connect each customer to the system and thus afford the customer an opportunity to take service if he so desires. The counter argument to the inclusion of certain distribution costs as customer costs is that mains are installed soly to serve the demands of consumers and should be allocated entirely to that function.

Representatives of residential and other small customers have vigorously opposed the so-called "minimum size method". The minimum size method classifies costs related with the minimum size mains as customer-related and allocate this cost according to weighted or unweighted customer number. Then the costs associated with distribution mains in excess of the minimum size plant are classified as demand-related and allocated to each customer class. The problem with this approach is that unavoidably, the minimum size facility has a certain load-carrying capacity. As a result of this method, small users would be allocated the cost of a minimum size distribution system that already satisfies much of their demand needs. In addition, they would be allocated another portion of the cost

based on their demands. This method therefore results in a double allocation of cost to small users unless the demand capacity of the minimum system is subtracted from class demands prior to allocating the demand-related costs. It is likely that this method would result in some small customers receiving an allocated cost that is even greater than their stand-alone cost.

Other experts attempt to correct the minimum load double allocation problem by advocating another method, the "zero-intercept method" or the "minimum-intercept method". It assumes that a no-load distribution system can be identified and allocated based on customer numbers. The general technique of this method is to relate installed cost to current carrying capacity. A curve is created for various sizes of the equipment involved, using regression techniques, and this curve is extended to a zero (no load) intercept. It is argued that this no load portion of the distribution mains costs are incurred solely to reach the customer's premise. Then incremental costs are incurred to satisfy different levels of the customer's demands. The problem with this method is that it attempts to identify the cost of something that does not physically exist and cannot actually be measured. The reference of a point that is outside the range that is defined by available data is generally forbidden in statistics because unreliable results can often be obtained. We have seen cases where negative cost were generated for the "no load mains system". These results and the faulty theoretical premise of this method raise serious doubt against the zero intercept method.

**Q. DOES OPC CHOOSE TO CLASSIFY ANY MAINS COST AS CUSTOMER-RELATED?**

A. No. I believe none of the mains cost that are shared among all customers should be classified as customer-related. However, I do recognize that a portion of the

distribution mains system can be separated out from the integrated system and directly assigned to the customer classes that utilized this portion. According to the Company's response to OPC DR. # 525, mains that have a diameter of 2" or smaller are only used by small customers. Therefore, I choose to directly assign this portion of the distribution mains to the residential and SGS customers and allocate the rest of the mains cost to all customer classes as a shared capacity-related cost.

**Q. PLEASE EXPLAIN THE SECOND CONTROVERSY IN MAINS COST ALLOCATION.**

A. There are a wide variety of alternative methods for determining and allocating capacity-related costs such as mains cost that produce drastically different cost assignments to the various customer classes. Each method has received support from some rate experts and no method is universally accepted. The electric industry has produced more alternatives than the gas industry. Different methods that I've come across in my past experiences in gas and electric cases include the following: the peak demand responsibility methods, the average and peak demand allocation method, the average and excess demand method, and the time differentiated allocation method.

**Q. PLEASE DESCRIBE THE PEAK DEMAND RESPONSIBILITY METHODS.**

A: A commonly used group of methods is called the peak demand responsibility method. This group of methods allocates the mains costs on coincident or non-coincident peak demand. Among this group, the single system coincident peak (1CP) demand allocation method uses the single annual system peak to measure customer cost responsibility. Adovates of this method assume that since a major

factor that drives the design of the system is the highest peak demand, the incremental cost of delivering gas on any day other than the peak day is zero. Therefore, this method allocates the total cost to the peak day and allocates zero cost to the other days. This method fails to reflect the fact that the utility system is built to satisfy the customers' daily demands for gas, not only the demands on the peak day, and allocates the entire cost of the joint production according to usages on a single day. Under this method, interruptible customers would generally receive no allocation of demand costs since they are assumed to be off the system during the peak period. In other words, if this method is adopted, interruptible customers would receive a "free ride" to use the distribution main system without paying any of its costs.

The non-coincident peak demand (NCP) allocation method attempts to correct the problem with the 1CP method by allocating the cost of the facilities in accordance with each customer class's contribution to the sum of the maximum demands that all customer classes' impose on the facilities. This method would result in all classes of customers being allocated a portion of system cost based upon their actual peak, regardless of the time of its occurrence. This method will allocate some cost to interruptible customers since their non-coincident demand would not be zero. However, this method still suffers from the flaw that it does not recognize that the system is built for the joint production to satisfy the everyday gas usage needs for all customers. It essentially allocates all costs to the one day of usage when the class non-coincident peak happens for the class and allocates nothing to the class's non-peak usage in the rest of the year.

**Q. PLEASE DESCRIBE THE AVERAGE AND PEAK DEMAND METHOD AND THE AVERAGE AND EXCESS METHOD.**

A: The average and peak demand (A&P) method attempts to account for the annual energy supply needs of the company in addition to the capacity needs. Total mains cost are multiplied by the system's load factor to arrive at the capacity costs attributed to average use and these capacity costs are apportioned to the various customer classes on an annual energy usage basis. The rest of the costs are considered to have been incurred to meet the coincident peak demands of the various classes of service. For example, if the load factor is 55%, then 45% (1-55%) of the total mains cost is considered to have been incurred because of the peak demand and is allocated to peak users.

The "average and excess" (A&E) allocation method appears to be similar to the A&P method because both methods divide the total cost into two parts based on the system load factor and both methods allocate the average usage portion based on average annual usage. However, this method differs drastically from the A&P method in its allocation of the demand portion. By allocating demand-related cost based on excess demand instead of total demand, this method gives an disproportional advantage to customers who use the system in a continuous manner and have little excess demand, and penalizes customers with low load factors and high excess demand.

**Q. PLEASE GIVE AN EXAMPLE TO ILLUSTRATE HOW DIFFERENT RESULTS ARE OBTAINED FROM DIFFERENT ALLOCATION METHODS.**

A. The following example illustrates the results of three allocation methods for two customers. These two customers have the same annual gas usage. However, they

have different load factors. In other words, one customer uses the system in a more continuous manner and the other customer has a more variable usage pattern and would cost the system more to satisfy its maximum demand. An appropriate allocation method would be expected to allocate more cost to the customer with the lower load factor.

Table 1. Demand and usage information for two customers with different load factors

| Customer | Load Factor | Average Demand (Annual Usage) | | Coincident Peak Demand | | Noncoincident Peak Demand | | Excess Demand | |
|---|---|---|---|---|---|---|---|---|---|
| Customer 1 | 0.8 | 100 | (50%) | 120 | (37.5%) | 125 | (38.5%) | 25 | (20%) |
| Customer 2 | 0.5 | 100 | (50%) | 200 | (62.5%) | 200 | (61.5%) | 100 | (80%) |
| Total | 0.625 | 200 | (100%) | 320 | (100%) | 325 | (100%) | 125 | (100%) |

Table 2. A comparison of different allocation methods

| Customer | Peak responsibility allocation method (1CP) | Peak responsibility allocation method (1NCP) | A&P Allocation method | A&E allocation method |
|---|---|---|---|---|
| Customer 1 | 37.5% | 38.5% | 50%*0.625+37.5%*0.375 = 45% | 50*0.625+20%*0.375 = 38.75% |
| Customer 2 | 62.5% | 61.5% | 50%*0.625+62.5%*0.375 = 55% | 50%*0.625+80%*0.375= 61.25% |
| Total | 100% | 100% | 100% | 100% |

The above example shows that different cost allocations would be generated by different allocation methods based on the same demand and usage data. Here all methods allocated more costs to customer 2 who has a lower load factor. However, the first 2 methods only rely on the peak demand and do not give any consideration to the annual energy usage. The result for A&P method reflects consideration of both factors. In contrast, although the A&E method appears to

allocate a portion of the total cost based on annual usage, it also allocates a large portion of the excess cost to the customer with a low load factor. Therefore, although the A&E method gives the appearance that it has considered the effect of the annual energy usage, its generally generates an end result that is very similar to a peak responsibility method.

**Q. PLEASE EXPLAIN THE TIME DIFFERENTIATED ALLOCATION METHOD.**

A. It is argued that traditional demand allocation methods do not consider differences in use over the course of a year and a time differentiated allocation method better reflects the fact that capacity-related costs are determined by loads throughout the year. It is argued that this kind of allocation methodology is equitable because every customer, large or small, residential or industrial, receives exactly the same cost allocation as every other customer taking service in the same time. It is only the difference in the timing of each class's usage that results in differences in the costs allocated to the classes for the entire year. In past electric and gas cases, the Commission Staff and OPC have allocated capacity-related costs based on each class's contribution to the sum of hourly class loads at each hour (time-of-use allocation method), or based on each class's contribution to the monthly peak demand in each month (the relative system utilization method or value of service method).

**Q. PLEASE EXPLAIN THE RELATIVE SYSTEM UTILIZATION METHOD.**

A. The RSUM method was developed by Charles Laderoute in a paper that he presented at the 1988 NRRI Biennial Regulatory Information Conference and modified by former OPC economist Philip Thompson in a paper he presented at

the 1992 NRRI Biennial Regulatory Information Conference. The basic idea of this method is to identify the portion of capacity that corresponds to each month's demand, and allocate the cost that corresponds to that capacity to customers who use gas in the month that this portion of the system is used. For example, if 50% of capacity is used in 12 months of the year and 55% of capacity is used in 11 months, the extra 5% of capacity is not utilized in one month, say, July. This method allocates the cost corresponding to 50% of capacity to every month, and customers who use gas in every month but July will also receive a share of the cost that is corresponding to the additional 5% capacity. This method allocates a level of costs to each customer class that is between the incremental cost and the stand alone cost for each class by weighting the usage share of each customer class on the relative system utilization of each month.

**Q. PLEASE PROVIDE A STEP BY STEP DESCRIPTION OF OPC'S MAINS ALLOCATION METHOD.**

A. In this case I chose to allocate the shared portion of distribution mains according to the relative system utilization method. Please refer to Schedule DIR HH-1. The table in step (1) lists the monthly peak demands for all customer classes that were provided by the Staff witness Dan Beck. The table in step (2) presents the same information but the data is sorted by total class demands in descending order.

In step (3) (Months % of Highest Peak), the total class peak day demands are converted to percentages of the maximum monthly peak day demand. For instance, December, the month having the second highest peak day demand has a peak that is 94.08% of the maximum peak day demand. Another way of stating

this is that there is a 5.92% increment of demand separating the two months (January and December).

The next row, step (4) (Increment of Demand / Cost), simply calculates successive differences in percentages of demand from step (3). Percentage increments in demand are assumed to be associated with (or reflect) percentage increments in the cost of the shared portion of distribution mains. Therefore, in step (4), the first figure is the difference in percentage costs incurred to supply the additional capacity in moving from the second highest monthly peak to the maximum monthly peak day demand. The second figure in this row is the same difference, only moving from the third highest monthly peak to the second highest monthly peak.

Step (5) (Number of Months Cost Occurred) depicts the number of months over which that cost increment should be spread. The first (highest or top increment) cost increment, occurring only on the peak day of one month is only spread to that month. The next increment of cost/capacity is utilized for two months. The last or base increment is utilized in all the months. In step (6), each cost increment is divided by the number of months in which the corresponding capacity increment is utilized.

In step (7) (Cost Attributable to Each Month), partial sums are formed for the cost increments utilized in each month. The peak month sums all the increments of costs in the previous column, since all increments of capacity are used in that month. The next partial sum for the next lowest month omits the top cost increment in its sum and so on. For example, the second number 18.78% is equal to the sum of all increments other than the increment in the first month (24.70% - 5.92%) and the third number 15.98% is equal to the sum of all increments other

than the increments in the first two months (24.70% - 5.92% - 5.61%). The result is the percentage of capacity costs attributable to each month.

In the next table that marked (8), class monthly peaks have been converted to percentages of the sum of peak day demands for all the classes each month. For example, in January, residential customers were responsible for 55.89% of the peak day demands. Further, in the last column labled "RSUM allocator", each cell sums the product of the class share of monthly peaks and the portion of total capacity costs in each month in step (7) for the corresponding customer class. For example, the 51.70% RSUM allocator for residential is equal to 55.89%*24.70% + 55.05%*18.78% + 55.43%*15.98% + ... + 16.92%*1.34%. Here each customer class's share in the usage of each month is weighted by the relative system utilization of that month. This gives the RSUM allocators that are applicable to the shared cost of the distribution mains.

In the last step, step (9), a composite mains allocator is formed by combining the directly assigned portion of mains and the shared portion of mains. Here 22% of the total mains cost were directly assigned to the residential and SGS class. The allocation between these two class is based on the same proportions of these two classes in the RSUM allocators.

## II. CLASS COST OF SERVICE STUDY RESULTS AND RATE DESIGN ANALYSIS

**Q. PLEASE DESCRIBE THE RESULTS OF OPC'S CCOS STUDY.**

A. OPC's CCOS study was performed by James Busch. The result of OPC's CCOS study indicates that the margin rate level for the residential class is currently producing returns that are approximately equal to the total company return, the SGS and LGS class are currently producing returns that exceed the total company return, and the LV class is currently producing a return below the level of the total company return. This class rate of return information is summarized below in Table 3.

Table 3 – CCOS Indicated Customer Class Returns

| | Total | Residential | SGS | LGS | LV |
|---|---|---|---|---|---|
| Returns | 8.82% | 8.73% | 11.56% | 15.95% | 3.68% |

In Table 4, I have also summarized the class revenue shift indicated by OPC's CCOS study in order to equalize class rates of return if the Company's total revenue remains at the current level.

Table 4 – CCOS Indicated Class Revenue Shifts

| | Residential | SGS | LGS | LV |
|---|---|---|---|---|
| Class Shifts | 312,393 | (2,555,937) | (634,299) | 2,877,803 |
| % Change | 0.33% | -8.96% | -21.19% | 24.87% |

**Q. WHAT IS THE RELATIVE IMPORTANCE OF CLASS COS STUDY RESULTS IN RATE DESIGN?**

A. A number of factors must be considered when determining the just and reasonable rate for a service. The factors include cost of service, the value of service, affordability, rate impact, and rate continuity. A CCOS study provides the Commission with a general guide as to the cost aspect of the just and reasonable rates. The manner in which the cost factor and all the other factors are balanced by the Commission in setting the rates can only be determined on a case-by-case basis.

**Q. WHAT RATE DESIGN PRINCIPLE IS OPC PROPOSING BASED ON THE REVENUE SHIFTS NEEDED TO EQUALIZE CLASS RATES OF RETURN INDICATED IN TABLE 3 FOR THIS CASE?**

A. OPC recommends that the Commission adopt a rate design that balances movement towards cost of service with rate impact and affordability considerations. To reach this balance, OPC believes that the Commission should impose, at a maximum, revenue shifts equal to one half of the revenue neutral shifts indicated by OPC's CCOS study. In addition, if the Commission determines that an increase in the total company revenue requirement is necessary, then no customer class should receive a net decrease as the combined result of the revenue neutral shift that is applied to that class and the share of the total revenue increase that is applied to that class.

**Q. PLEASE DESCRIBE THE INFORMATION CONTAINED IN SCHEDULE DIR HH-2 AND EXPLAIN HOW IT WAS CALCULATED.**

A. Schedule DIR HH-2 shows how OPC's rate design principle can be applied assuming the Commission approved total company revenue increase is at $39 mil, $11 million and $1 million. The same series of calculations can be repeated for any revenue requirement increase or decrease that is determined by the Commission. The schedule illustrates the combined impact of spreading three potential revenue requirement increase amounts to customer classes and the revenue neutral class revenue shifts recommended by OPC.

For example, line 16 of this Schedule shows how the $1 million revenue requirement increase has been spread to the various customer classes. Then line 21 shows the combined impact of the $1 million revenue increase and revenue neutral shift for each class was derived by adding each classes' share of the $1 million revenue requirement increase to the revenue neutral shifts that OPC has recommended for each class. For example, in line 16, we see that $687,388 is allocated to the residential class as a result of spreading a revenue requirement increase of $1 million. This $687,388 amount is then added to the $156,196 revenue neutral shift amount for the residential class that appears in line 10. The sum of these two amounts, $843,584, appears in line 21 under the residential column and represents OPC's recommendation for the combined impact of revenue neutral shifts and share of overall revenue requirement increase that should be reflected in rates resulting from this case if the overall revenue requirement is increased by $1 million.

**Q. PLEASE EXPLAIN HOW THE ADJUSTED COMBINED IMPACT AMOUNTS THAT APPEAR IN LINES 24 THROUGH 27 OF SCHEDULE DIR HH-2 WERE CALCULATED.**

A. Based on rate impact and equity considerations, OPC believes that no customer class should receive a net class rate revenue increase when there is an overall revenue requirement reduction and no customer class should receive a net class revenue decrease when there is an overall revenue requirement increase. The combined impact of revenue increase and OPC's revenue neutral shift numbers are thus adjusted further to reflect this consideration. For example, for the case of a $1 million increase, line 16 of Schedule DIR HH-2 shows that the spread of the overall revenue increase to the SGS and LGS class is too small to offset their revenue neutral shift. This causes those classes to end up with net decreases. In this case the following steps should be followed to get our recommended result: (1) keeping the current class rate revenue requirement for SGS and LGS classes unchanged; (2) giving each of the other classes the share of the increase shown in lines 21; and (3) reducing the increase in the class revenue requirement for these other classes from step (2) by an amount equals to the sum of net decreases for the SGS and LGS classes that were eliminated. Line 36 shows the class revenue percentage results from this series of allocations of the total company revenue requirement to each class at the $1 million level.

**Q. PLEASE SUMMARIZE OPC'S RATE DESIGN RECOMMENDATION FOR THE CLASS REVENUE REQUIREMENTS THAT SHOULD RESULT FROM ANY INCREASE OR REDUCTION IN OVERALL REVENUE REQUIREMENT THAT THE COMMISSION DETERMINES TO BE REASONABLE IN THIS CASE.**

A. In this testimony, OPC has proposed and illustrated the application of a method for increasing **class** revenue requirements to go along with any increase in the **overall** revenue requirement. This method could be utilized to calculate class revenue requirements for any level of overall revenue requirement increase or reduction that is ultimately decided in this case. Schedule DIR HH-2 shows the result of applying OPC's recommended method for determining class revenue requirements to potential revenue requirement increase levels of $1 million, $11 million or $39 million. OPC could supply similar calculations to the Commission for any other amounts of change in the overall revenue requirement if requested to do so.

**Q. DID YOU PERFORM ANY ANALYSIS REGARDING MGE'S RESIDENTIAL CUSTOMER CHARGE?**

A. Yes, OPC's CCOS study showed that the customer-related cost, which is one of the factors considered in the determination of a customer charge level, is $8.35. The customer-related cost calculation was based on the assumption that MGE's costs are accurately reflected in the accounting schedules contained in the Staff's direct testimony filing. The costs that are included in the customer charge calculation are the costs that are related to services, meters, regulators, and customer accounts expenses. The costs associated with services, meters, and regulators include the return on rate base for the relevant plant accounts,

distribution operation and maintenance expenses associated with services, meters, and regulators, plus the depreciation expense associated with services, meters, and regulators.

**Q. WHAT IS OPC'S PROPOSAL FOR THE CUSTOMER CHARGE FOR RESIDENTIAL CUSTOMERS?**

A. OPC recommends that the residential customer charge should remain at its current level of $9.05 if the Commission determines that the revenue requirement for residential class should be increased by 10% or less. If instead the Commission approves more than a 10% increases in the residential revenue requirement, the residential customer charge should be increased by the residential revenue increase percentage less 10%.

**Q. WHAT IS OPC'S RATE DESIGN PROPOSAL FOR THE OTHER RATE COMPONENTS OF THE RESIDENTIAL CLASS AND FOR THE OTHER CUSTOMER CLASSES?**

A: For the residential class, OPC proposes to recover all the rest of revenue requirement increases through an increase in the delivery charge. OPC is not making any recommendations for the rate components of the other customer classes at this time.

**Q. DOES OPC HAVE ANY OTHER RATE DESIGN PROPOSALS?**

A. Yes. OPC is recommending a low-income fixed credit rate proposal for low-income residential customers. OPC witness Roger D. Colton will address this proposal in his direct testimony.

## III. MISCELLANEOUS TARIFF ISSUES

**Q. DO YOU WANT TO ADDRESS ANY OTHER RATE DESIGN ISSUES IN THIS TESTIMONY?**

A. Yes, I will address one more issue. It has come to Public Counsel's attention that MGE is billing some residential customers at the higher small general service (SGS) rate. A MGE consumer has alerted us to the fact that MGE is charging the SGS rate at a residential premise where the gas is consumed for "domestic use." In the situation that the consumer alerted us to, the parent of the student living at a single metered residential premise is paying the utility bill for his son and the bill is sent to the parent at his address instead of being sent to the student at the residential premise where the gas is being consumed. Since the gas consumed by the student is billed at the SGS rate, the annual bill for the gas consumed at the student's residence is higher than it would be if the consumption was billed at the lower Residential rate. If MGE is charging sales tax for this "domestic use" that could be contrary to Section 144.030(23) RSMO. Public Counsel believes that requiring certain residential customers at single metered single family premises to pay more than similarly situated customers solely due to the fact that the individual responsible for paying for utility service does not live at the premises where the gas is consumed is inequitable and could be contrary to Missouri law.

**Q. HAVE YOU EXAMINED MGE'S TARIFFS TO SEE IF THE BILL FOR THE GAS CONSUMED AT THE STUDENT'S RESIDENCE IS CONSISTENT WITH THE APPLICABILITY PROVISIONS IN THE TARIFF?**

A. Yes. My examination revealed that MGE's Residential Gas Service (RS) tariff states that "service hereunder is not available to... a location other than the customers domicile." MGE's General Terms and Conditions for Gas Service define customer in pertinent part as "a person or legal entity responsible for payment for service except one denoted as a guarantor." Therefore, MGE's method of billing for the gas consumed the student's premises appears to be consistent with the Company's tariff. However, counsel informs me that this billing method is not consistent with Section 144.030(23) of Missouri law.

**Q. DOES THE DEFINITION OF "DOMESTIC USE" IN SECTION 144.030(23) RSMO INCLUDE GAS CONSUMED IN A RESIDENTIAL PREMISE, REGARDLESS OF WHO PAYS THE BILL FOR THIS UTILITY SERVICE?**

A. Yes. In the statute, the definition of "domestic use" includes "that portion of metered...natural, artificial, or propane gas...which an individual occupant of a residential premises uses for non-business, noncommercial, or nonindustrial purposes." In addition, the statue states that "regulated utility sellers shall determine whether individual purchasers are exempt or non exempt [from sales taxes on utility service] based upon the seller's utility service rate classification as contained in tariffs on file with and approved by the Missouri public service commission" and that "sales and purchases made pursuant to the rate classification 'residential'...shall be considered as sales for domestic use and such sales shall be exempt from sales tax." The statute intends for the type of utility

service that the student receives to be considered "domestic use" that should be served under the "residential" rate classification.

**Q. WHAT DOES PUBLIC COUNSEL RECOMMEND TO ELIMINATE THE INEQUITABLE AND POSSIBILY UNLAWFUL BILLING PRACTICE THAT YOU ARE ADDRESSING IN THIS TESTIMONY.**

A. OPC recommends that the Commission order MGE to change its residential tariff to make it equitable and consistent with Missouri law for residential customers at single metered single family premises where the individual responsible for paying for utility service does not live at the premises where the gas is consumed. We recommend changing the "Applicable" section of MGE's RS tariff so it states the following:

> A "residential" ("domestic") customer under this residential rate classification is a customer who purchases natural gas for "domestic use." "Domestic use" under this rate classification includes that portion of natural gas which is ultimately consumed at a single-family or individually metered multiple-family dwelling, and shall apply to all such purchases regardless of whether the customer is the ultimate consumer.
>
> This schedule is intended to satisfy the provisions of Section 144.030(23) RSMo by establishing and maintaining a system and rate classification of "residential" to cause the residential sales and purchases of natural gas under this rate schedule to be considered as sales for domestic use.

**Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

A. Yes.

## Distribution Mains Allocation - Relative System Utilization Method

MGE Case No. GR-2001-292

| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Residential | 4,515,223 | 3,961,727 | 3,038,863 | 1,993,966 | 1,165,864 | 419,157 | 220,532 | 262,241 | 1,017,882 | 1,765,835 | 2,831,849 | 4,184,228 |
| | SGS | 1,721,318 | 1,533,161 | 1,180,620 | 792,454 | 481,800 | 207,955 | 137,104 | 150,889 | 417,532 | 686,125 | 1,087,633 | 1,628,665 |
| (1) | LGS | 286,627 | 251,023 | 197,793 | 135,490 | 86,995 | 42,389 | 30,053 | 32,488 | 75,698 | 117,173 | 175,858 | 250,185 |
| | LVS | 1,555,085 | 1,401,205 | 1,286,600 | 1,075,387 | 1,058,505 | 950,038 | 915,764 | 1,306,292 | 1,016,897 | 1,134,545 | 1,224,157 | 1,537,056 |
| | Total | 8,078,253 | 7,147,116 | 5,703,876 | 3,997,298 | 2,793,163 | 1,619,538 | 1,303,453 | 1,751,911 | 2,528,009 | 3,703,678 | 5,319,497 | 7,600,133 |

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| (2) | LGS | 286,627 | 250,185 | 251,023 | 197,793 | 175,858 | 135,490 | 117,173 | 86,995 | 75,698 | 32,488 | 42,389 | 30,053 |
| | LVS | 1,555,085 | 1,537,056 | 1,401,205 | 1,286,600 | 1,224,157 | 1,075,387 | 1,134,545 | 1,058,505 | 1,016,897 | 1,306,292 | 950,038 | 915,764 |
| | Total | 8,078,253 | 7,600,133 | 7,147,116 | 5,703,876 | 5,319,497 | 3,997,298 | 3,703,678 | 2,793,163 | 2,528,009 | 1,751,911 | 1,619,538 | 1,303,453 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (3) | Months % of Highest Peak | 100.00% | 94.08% | 88.47% | 70.61% | 65.85% | 49.48% | 45.85% | 34.58% | 31.29% | 21.69% | 20.05% | 16.14% |
| (4) | Increment of Demand / Cost | 5.92% | 5.61% | 17.87% | 4.76% | 16.37% | 3.63% | 11.27% | 3.28% | 9.61% | 1.64% | 3.91% | 16.14% |
| (5) | # of Months Cost Occurred | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| (6) | (4)/(5) | 5.92% | 2.80% | 5.96% | 1.19% | 3.27% | 0.61% | 1.61% | 0.41% | 1.07% | 0.16% | 0.36% | 1.34% |
| (7) | Cost Attributable to each Month | 24.70% | 18.78% | 15.98% | 10.02% | 8.83% | 5.56% | 4.95% | 3.34% | 2.93% | 1.86% | 1.70% | 1.34% |

| | | Jan | Dec | Feb | Mar | Nov | Apr | Oct | May | Sep | Aug | Jun | Jul | RSUM Allocator |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Residential | 55.89% | 55.05% | 55.43% | 53.28% | 53.24% | 49.88% | 47.68% | 41.74% | 40.26% | 14.97% | 25.88% | 16.92% | **51.70%** |
| | SGS | 21.31% | 21.43% | 21.45% | 20.70% | 20.45% | 19.82% | 18.53% | 17.25% | 16.52% | 8.61% | 12.84% | 10.52% | **20.19%** |
| (8) | LGS | 3.55% | 3.29% | 3.51% | 3.47% | 3.31% | 3.39% | 3.16% | 3.11% | 2.99% | 1.85% | 2.62% | 2.31% | **3.34%** |
| | LVS | 19.25% | 20.22% | 19.61% | 22.56% | 23.01% | 26.90% | 30.63% | 37.90% | 40.23% | 74.56% | 58.66% | 70.26% | **24.77%** |
| | Total | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | **100.00%** |

| | | Directly | Assigned | Shared | **Composite Mains Allocation** |
|---|---|---|---|---|---|
| | | | 22% | 78% | |
| | Residential | 51.70% | 71.91% | 51.70% | **56.14%** |
| | SGS | 20.19% | 28.09% | 20.19% | **21.93%** |
| (9) | LGS | | | 3.34% | **2.61%** |
| | LVS | | | 24.77% | **19.32%** |
| | Total | 71.89% | 100.00% | 100.00% | **100.00%** |

## OPC RATE DESIGN RECOMMENDATION

MGE Case No. GR-2001-292

| | | TOTAL | RESIDENTIAL | SMALL GS | LARGE GS | LARGE VOLUME | UMGL |
|---|---|---|---|---|---|---|---|
| 1 | Revenue Neutral Shifts (RNS) to Equalize Class | | | | | | |
| 2 | Rates of Return (ROR) | ($0) | $312,393 | ($2,555,937) | ($634,299) | $2,877,803 | $40 |
| 3 | | | | | | | |
| 4 | Percentage Revenue Change to Equalize Class ROR | 0.00% | 0.33% | -8.96% | -21.19% | 24.87% | 1.33% |
| 5 | | | | | | | |
| 6 | Current Class Revenue Percentages | 100.00% | 68.63% | 20.73% | 2.17% | 8.47% | 0.00% |
| 7 | | | | | | | |
| 8 | COS Indicated Class Revenue Percentages | 100.00% | 68.85% | 18.91% | 1.72% | 10.52% | 0.00% |
| 9 | | | | | | | |
| 10 | **OPC's Recommended Revenue Neutral Shifts** | $ (0) | $ 156,196 | $ (1,277,968) | $ (317,150) | $ 1,438,901 | $ 20 |
| 11 | | | | | | | |
| 12 | OPC's Recommended Revenue Percentages | 100.00% | 68.74% | 19.82% | 1.94% | 9.50% | 0.00% |
| 13 | | | | | | | |
| 14 | **Spread of Proposed Revenue Requirement Increases** | | | | | | |
| 15 | MGE's Proposed Revenue Requirement Increase | 39,882,006 | 27,414,403 | 7,902,913 | 775,115 | 3,788,699 | 877 |
| 16 | Revenue Requirement Increase of 1mil | 1,000,000 | 687,388 | 198,157 | 19,435 | 94,998 | 22 |
| 17 | Revenue Requirement Increase of 11mil | 11,000,000 | 7,561,265 | 2,179,731 | 213,787 | 1,044,975 | 242 |
| 18 | | | | | | | |
| 19 | **Combined Impact of Revenue Increase and OPC's RNS** | | | | | | |
| 20 | MGE's Proposed Revenue Requirement Increase | 39,882,006 | 27,570,599 | 6,624,945 | 457,965 | 5,227,600 | 897 |
| 21 | Revenue Requirement Increase of 1mil | 1,000,000 | 843,584 | (1,079,811) | (297,714) | 1,533,899 | 42 |
| 22 | Revenue Requirement Increase of 11mil | 11,000,000 | 7,717,462 | 901,763 | (103,362) | 2,483,876 | 262 |
| 23 | | | | | | | |
| 24 | **Adjusted Impact of Revenue Increase and OPC's RNS** | | | | | | |
| 25 | MGE's Proposed Revenue Requirement Increase | 39,882,006 | 27,570,599 | 6,624,945 | 457,965 | 5,227,600 | 897 |
| 26 | Revenue Requirement Increase of 1mil | 1,000,000 | 354,816 | - | - | 645,166 | 18 |
| 27 | Revenue Requirement Increase of 11mil | 11,000,000 | 7,645,619 | 893,368 | - | 2,460,753 | 259 |
| 28 | | | | | | | |
| 29 | **Adjusted Percentage Change in Class Rate Revenue** | | | | | | |
| 30 | MGE's Proposed Revenue Requirement Increase | 28.41% | 28.62% | 22.77% | 15.04% | 43.94% | 29.25% |
| 31 | Revenue Requirement Increase of 1mil | 0.71% | 0.37% | 0.00% | 0.00% | 5.42% | 0.58% |
| 32 | Revenue Requirement Increase of 11mil | 7.84% | 7.94% | 3.07% | 0.00% | 20.68% | 8.46% |
| 33 | | | | | | | |
| 34 | **ADJUSTED REVENUE PERCENTAGE** | | | | | | |
| 35 | MGE's Proposed Revenue Requirement Increase | 100.00% | 68.74% | 19.82% | 1.94% | 9.50% | 0.00% |
| 36 | Revenue Requirement Increase of 1mil | 100.00% | 68.39% | 20.58% | 2.15% | 8.87% | 0.00% |
| 37 | Revenue Requirement Increase of 11mil | 100.00% | 68.69% | 19.81% | 2.01% | 9.48% | 0.00% |