BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF UTAH

IN THE MATTER OF THE APPLICATION OF QUESTAR GAS COMPANY FOR AND INCREASE IN ITS RATES AND CHARGES	))))	<u>DOCKET NO. 02-057-02</u>

DIRECT TESTIMONY OF DAVID NICHOLS
ON BEHALF OF THE UTAH ENERGY OFFICE
UTAH DEPARTMENT OF NATURAL RESOURCES

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

A. I am David Nichols. My address is 1070 Beacon Street, Boston, Massachusetts 02446. I am an independent energy analyst and researcher. Through the Tellus Institute in Boston, I am consulting to the Utah Energy Office in the present proceeding. I have previously testified before this Commission in Docket No. 01-035-01. My qualifications are summarized in my appended resume.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Utah Energy Office (UEO) in the Department of Natural Resources of the State of Utah.

Q. What is the purpose of your testimony?

A. The Questar Gas Company (Questar) has filed a rate increase application with the Utah Public Service Commission (the Commission).[1] Utah Energy Office (UEO) has intervened in this case. Among UEO's objectives are helping provide reliable supplies of energy for Utahns, at low cost, and with minimal environmental impacts. In this testimony, I explain how Questar can more effectively promote efficiency in the use of gas. I focus on two means of encouraging efficiency in the use of gas, namely:

- The design of natural gas tariffs.
- The development of demand-side management programs.

In addressing these topics, a central business perspective and strategy of Questar must be confronted. Questar wishes to promote both customer growth and increased use of gas per customer, seeing these objectives as tied to both its business success and its level of retail rates. After setting forth an alternative perspective which points toward an increased focus on efficiency, my testimony concludes with the issue of how to reconcile a focus on efficiency with the business objectives of Questar.

Q. What is the State of Utah's policy with respect to energy efficiency?

A. On March 14, 2001, Governor Leavitt issued a set of energy policy principles for his administration to implement. The Governor stated that "Utah will cultivate an ethic of conservation and energy efficiency," and that "public policies will support sustained

1 IN THE MATTER OF THE APPLICATION OF QUESTAR GAS COMPANY FOR AN INCREASE IN RATES AND CHARGES, Docket No. 02-057-02, May 3, 2002.

investments in cost effective demand side management and increased use of energy efficient technologies and services in Utah's economy." I believe that consideration of how to promote increased efficiency in the use of gas is consistent with these policy principals supported by the Leavitt administration.

TARIFF DESIGN ISSUES

Q. What tariff design issues does your testimony address?

A. Retail tariff (or "rate") designs serve several functions. Rates provide the utility with an opportunity to collect the required revenues that are included in the utility's test year data as approved by the Commission. Rate designs should also reflect a variety of other criteria such as fairness in reflecting the costs of service among different classes of rate-payers, and promoting efficiency in the use of energy.2 Utah's statutory definition of "Just and Reasonable Rates" includes, among just and reasonable factors, " means of encouraging conservation of resources and energy."3

In this testimony I do not consider the revenue requirements that rates are designed to collect. Rather, I focus on certain issues regarding the design or structure of rates. Questar does not propose to change the structure of GS-1 or its other major rates. However, it appears to me that the design of Questar's rates does not promote efficiency in the use of natural gas. Consider, for example, rate GS-1, the tariff under which the great majority of

2 See, for example, James Bonbright, *Principles of Public Utility Rates*, 1961.

its customers, both residential and commercial, are served. In addition to its basic monthly fee, Rate GS-1 has volumetric charges that vary with the amount of gas consumed. The overall volumetric charge is significantly lower for all monthly usage over 45 decatherms (Dth) than it is for the first 45 Dth the customer uses. This structure sends customers the "price signal" that the cost of gas declines as more is used.

In response to Committee of Consumer Services data request no. 14.52, Questar witness Kennedy explains that Questar has had declining block rates for many years, that the company prefers declining block rates, and that the terminal blocks in the rates are designed to encourage increased gas use.

In light of the State's policy interest in "cultivating an ethic of conservation and energy efficiency" and the Commission's legislative mandate to "facilitate the…conservation of utility resources" I suggest it is time for Questar to abandon this rate design philosophy.4 I would point out that the price of natural gas in regional markets has fluctuated significantly in recent years. It is always difficult to forecast future prices, but one underlying reality suggests that the real price of gas in future years will be higher than is was in the closing decades of the last century. That reality is that natural gas is a scarce fossil fuel resource that is increasingly in demand for multiple uses including space conditioning in buildings, industrial process uses, and electricity generation. In view of the cost and resource

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3 Utah Code Annotated, §54-3-1 (2000)
4See Governor Leavitt's "Energy Policy" statement, March 14, 2001 and UCA §54-1-10 (2000).

pressures on natural gas supplies, I urge the company and the Commission to reconsider historic rate design practices. In the interest of resource conservation and to help abate pressures for increased gas prices, rate design should shift to "flat" volumetric charges (the same charge for all Dth) or, preferably, "inclining block" designs whereby usage in the terminal block would be priced higher than usage in the first block.

Q. How should Questar go about revising the structure of rate G-1?

A. Rate G-1 serves all but around 700 very large volume Questar customers. Therefore, customers with small to moderate usage are grouped with customers whose usage is in a larger range. Specifically, residential and small commercial customers are grouped with general business customers whose average usage is greater. The first step to rate redesign could be to break G-1 into two rates based on load research. Such load research could be accomplished quite quickly using computerized billing data in the utility's possession. Once a reasonable division of the rate was accomplished, the next step would be to design a blocking structure for each of the two resulting rates. There would be at least two blocks in each rate, designed so that the majority of users experience at least some usage in the terminal or "tail" block. In this way the majority of customers would experience the price signal that increased usage is more costly, implying that efficiency in the use of gas is a valuable practice.

Q. Questar argues that declining use of gas per customer in time causes average rates to all customers to be higher. If this is true, won't rates be higher if customers use gas

more efficiently?

A. In the short run this may be true. If the average customer reduced his or her use of gas, then the distribution non-gas (DNG) charge would need to be higher for the utility to recover its fixed costs through the reduced volumes sold, all else equal. However, several other factors should be borne in mind:

- Over the longer run, distribution non-gas costs vary with the volume of gas delivered. A study of the relationship between the growth of these costs and the volumes delivered would need to be performed in order to quantify this relationship. Some gas utilities have conducted such long-run studies, sometimes called “avoided cost” studies. Questar, to my knowledge, has not. If some kinds of DNG costs are positively correlated with load growth over the long run, the level of these costs that need to be collected through rates will be lower if use per customer stabilizes or continues to decline, as opposed to growing.
- If customers use gas more efficiently their energy bills will be lower, the resource will be conserved for future generations, and the level of emissions of pollutants into the atmosphere will be reduced. I believe that the Commission and the state’s energy policy value these kinds of benefits.
- Finally, the gas commodity portion of rates will be lower even in the short term if gas is used more efficiently. About half of the natural gas supplied to retail users by Questar is cost-of-service regulated gas that is usually lower in cost than the portion of natural gas

which Questar must procure from gas markets. The more rapidly gas usage grows, the larger will be the portion of market-based gas in the mix, and the higher will be the commodity charge. For this reason, a slower rate of growth in total gas sales will result in lower commodity charges.

Q. You explain that gas commodity charges will be lower if gas usage grows more slowly. Are you aware that Questar's application in this proceeding does not address commodity charges?

A. Yes, I am. I am not addressing commodity charges per se. I simply point out that if gas is used more efficiently -- either because of a new declining block structure in the DNG portion of rates, as discussed above, or because of new demand-side management programs, as discussed below -- this will lead to lower levels of commodity charge.

However, I also believe it may also be timely for the Commission to consider the design of commodity charges per se, as well as the charges to recover supplier non-gas (SNG) costs. It is difficult to do so in that there is no true rate design process for Questar's gas commodity and SNG charges. On January 1, 2003, customers would be subject to one set of new rates, which include DNG charges, SNG charges, and commodity charges. However, the commodity and SNG charges are set in separate "pass through" proceedings by simply dividing the utility's lincurred costs by gas volumes sold. Commodity charges are the single largest component of rate G-1. If Questar and the Commission are to consider the design of commodity and SNG charges to better reflect the rate design principle of promoting efficiency, customary ratemaking practice would have to be modified. Specifically, I suggest that the Commission could either:

- Consider changes to the design of commodity and SNG charges (not the level of revenue) in this proceeding.
- Or, declare the intent to consider the design of commodity and SNG charges in the next "pass-through" proceeding.

Either of these approaches would create the opportunity for thoughtful consideration of how rate design principles should be reflected in the structure of commodity and SNG charges.

Q. You have explained why you believe there is a need to consider, design, and implement inclining block rate structures. Will you address any other tariff design issues?

A. Yes, I will address the need for seasonal variation in the DNG component of gas rates. Rate GS-1's volumetric DNG charges are lower in summer than they are in winter. The difference in seasonal rates is directionally appropriate, since it costs the utility more to provide distribution services in winter. However, the charges in winter rates are only 9-17% higher than in summer rates. I am not aware of any cost of service basis for the current seasonal rate differentials. I believe it is important to explore the utility's costs to deliver winter gas versus summer gas, to determine whether the seasonal difference in the cost of service is adequately reflected in rate designs. The use of gas in the coldest month of the year is about ten times greater than in the warmest month. Gas transmission, distribution, balancing, and metering equipment is installed and operated to handle volumes that will be delivered in the coldest month, indeed on the coldest day. Some of these cost elements are reflected in the SNG charge, which is strongly differentiated by season, but others are reflected in the DNG charge, which is not. I believe that Questar needs to modify its cost of service and allocate DNG costs using some method that gives substantial weight to the season of the year. I believe that any plausible cost of service methodology would imply a greater differential in seasonal DNG rates than that which now exists. As in the case of inclining block rates, my point here goes not to the amount of revenue rates are designed to collect, but in the design of their structure-- in particular the price signals communicated to consumers. The signal that it costs significantly more to provide gas in winter would appropriately communicate the higher value and cost of gas as usage levels increase. I suggest that the Commission ask Questar to double the differential between summer and winter volumetric rates for now, and present cost of service data on seasonally varying DNG costs in its next rate case.

DEMAND SIDE MANAGEMENT ISSUES

Q. What demand side management issues does your testimony address?

A. As a result of initiatives undertaken by the UEO and other parties in and out of Commission proceedings during the last two years, it is increasingly the case that Utah

Power Company pursues demand-side load management and energy conservation strategies to help reduce peak period power costs and provide Utah households and businesses with tools to control their electricity use. Similar benefits could be achieved from gas demand-side management. However, Questar does not pursue demand-side management. Given the concern Questar expresses about insufficient revenues in its pre-filed testimony in the present rate case, it may be that the utility has little business interest in assisting customers to use gas more efficiently. However, it is interesting that at least one major type of demand-side management technology --gas-fired on-site combined heat and power systems-- would tend to increase gas revenues.

In order to put gas demand-side management on the agendas of Questar and the Commission, my testimony presents several points:

- How energy use can be reduced through demand-side management.
- Examples of how gas utilities successfully pursue demand-side management.
- The methodology for a comprehensive study of demand-side management which Questar could conduct for its Utah service area.
- Discussion of how gas utilities recover their costs for demand-side management.

Q. How can energy use be reduced through demand-side management?

A. Demand-side management (DSM) consists of market interventions to increase the productivity with which natural gas (or other forms of energy) is used. DSM originated over two decades ago when some electric utilities experiencing rapid load growth decided to develop programs to reduce customer demand during the peak and near-peak hours that were driving load growth. From its specific early focus, DSM matured rapidly during the late 1980s and early 1990s to encompass a broader perspective, energy efficiency. Gas utilities began to evaluate and implement DSM.

Energy efficiency refers to reducing energy input compared to useful energy output. Energy efficiency encompasses a range of demand-side technologies and practices that could increase the productivity (or efficiency) of gas consumption. The range of options is substantial, though not as extensive as in the area of electricity use. An example of a gas energy efficiency technology would be the use of highest efficiency residential gas furnaces so as to reduce the natural gas required for space heating. High efficiency furnaces have an Annual Fuel Utilization Efficiency (AFUE) of 90-95 percent, compared to standard new gas furnaces which are in the 78 to 85 percent AFUE range. The high efficiency furnace costs more, as efficient technologies often do, but then saves fuel costs every year over its long operating lifetime. Other examples would include such measures as:

- Installing insulation in homes.
- Sealing leaks in the ducts that carry conditioned air from the furnace to living spaces.
- Programmable thermostats.
- Installing highest efficiency domestic gas water heaters.
- Other residential appliances -- efficient washing machines, cooking equipment, pool heaters, etc.

- High efficiency commercial space heating equipment and controls.
- High efficiency commercial water heating equipment and controls.
- Food service equipment (ovens, steamers, griddles),
- Other efficient commercial/industrial technologies.

Q. How do DSM programs work?

A. Utility energy efficiency programs often include combinations of information, education, marketing, technical assistance, and financial incentives and/or financing arrangements. Substantial experience with demand-side energy efficiency programs has accumulated in the 20 plus years since they were pioneered by some western states. This experience can be drawn on to design programs that are likely to have strong market impacts in Questar's Utah service territory. A common design approach is to target technologies or efficiency practices which, while commercially available, are only penetrating a given market to a low degree due to market barriers. Again, the high AFUE gas furnace would be an example. The informational and financial resources of a program are then targeted to customers, retailers, wholesalers, manufacturers, building managers, energy service contractors, and/or other market actors based on where the greatest leverage to influence behavior lies given the structure of the market.

Q. Would all DSM options reduce the use of gas?

A. Not necessarily. I would consider gas-fueled on-site combined heat and power (CHP) systems to be a potential DSM technology. CHP systems produce electricity and thermal energy for heating or process needs (they "co-generate"). In so doing, they make use of heat that would be wasted in conventional electric generating plants. With CHP, electricity is generated and the heat that would otherwise be wasted is used for process heating requirements, water heating, or other thermal loads. In the Tellus report on electric DSM in Utah, on-site CHP systems were found to be cost-effective from a total resource cost perspective.5 In prior testimony I have recommended that Utah Power Company should consider promoting on-site CHP as a way of reducing electricity required from their grid. Another possibility would be for Questar to actively promote and market CHP through a DSM initiative. New gas-fired CHP could increase Questar's net gas sales and improve the efficiency of gas utilization for electricity generation while at the same time reducing the total resource costs of meeting Utah electricity and natural gas needs.

I would also note that CHP is a form of distributed generation. Distributed generation, including CHP, represents an important potential source of electricity for Utah's economy. The Governor's energy policy calls for the "development of new energy supplies sufficient to meet Utah's growing demand." Moreover, in Title 54 Chapter 12, Section (1), *Small Power Production and Cogeneration*, the Utah Legislature has declared that "It is the policy of this state to encourage the development of small power production and cogeneration facilities...." and that:

5 See *An Economic Analysis of Achievable New Demand-Side Management Opportunities in Utah,* Tellus Institute, May 2001.

> "[t]To promote the more rapid development of new sources of electrical energy, to maintain the economic vitality of the state through the continuing production of goods and the employment of its people, and to promote the efficient utilization and distribution of energy, it is desirable and necessary to encourage independent energy producers to competitively develop sources of electric energy not otherwise available to Utah businesses, residences, and industries served by electrical corporations, and to remove unnecessary barriers to energy transactions involving independent energy producers..."

The Commission's support and Questar's promotion of gas-fired CHP would be consistent with this legislative policy.

Q. You referred to the "total resource cost perspective." Please define this.

A. When evaluating the development of possible new DSM initiatives, cost-effectiveness assessment is often based on the total resource cost or "TRC" perspective. The TRC perspective identifies demand-side options whose costs are lower than the costs to supply the energy needed in their absence, and then asks whether market interventions to promote use of those options can be mounted at reasonable cost and with reasonable success by the utility (or by any other entity charged with assessing and implementing DSM). In Utah, the TRC perspective has been defined as a basic perspective for assessing electric DSM. The Commission has not to my knowledge defined a basic cost-effectiveness test for gas DSM, but the TRC approach certainly could be applied there as well.

Q. What issues arise when both the gas utility and the electric utility jointly pursue DSM?

A. There are a number of potential DSM technologies which have implications for the use of both gas and electricity. I provided one example in my discussion of on-site CHP. If the gas utility is involved in DSM, it could help to promote CHP, to the benefit of both gas and electric ratepayers, so that the electric utility's DSM budget might not need to be expand to capture CHP opportunities.

Another example has come up in the course of cost-effectiveness assessment of some new DSM programs which PacifiCorp is currently conducting in consultation with the UEO, the Land and Water Fund of the Rockies, and the Commission's Energy Efficiency Advisory Group. Preliminary cost-effectiveness screening has found that a program to seal leaky air delivery ducts in homes would not quite be cost-effective when the only benefit considered is the reduction in electricity requirements for air conditioning. However, repair of air delivery ducts also saves on gas requirements for space heating. If that benefit were considered, the program would likely prove cost-effective. Each utility could support the program based on the value of its own avoided supply costs.

Q. You indicated that gas DSM is pursued by a number of utilities. Please provide examples.

A. Certainly. While gas DSM is not as widely pursued as electric DSM, its value is recognized by utilities, regulators, and customers in several North American jurisdictions. I will provide examples from jurisdictions where a moderate to substantial gas DSM effort is under way. At all of these utilities, DSM consists of a mix of information, marketing, technical assistance, financial incentives, and financing arrangements.

- In New Jersey, the four investor owned gas utilities conduct a range of common statewide DSM programs to promote high efficiency residential gas furnaces, boilers, and water heaters; proper insulation levels in new homes; installation of insulation and weatherization in homes occupied by those of lower income; a range of efficiency technologies for business and industrial heating and process energy needs provided they are cost-effective based on a total resource cost assessment of projected savings compared to measure costs; and installation of gas-fired fuel cells for on-site electric generation.
- Minnegasco, Minnesota's largest gas utility, provides on-site home energy audits and conducts other DSM programs to promote high-efficiency residential gas furnaces, residential combination water/space heaters, efficient commercial heating systems, tune-up services for commercial heating systems, dehumidification for manufacturing processes, and custom efficiency technologies identified by business customers provided they are cost-effective based on a total resource cost assessment of projected savings compared to measure costs.
- Southern California Gas Company (SoCalGas) delivers a range of DSM programs comprised of some that are statewide in California and others of its own design. Its residential programs promote high-efficiency residential equipment including gas

furnaces, programmable thermostats, water heaters, clothes washers, and dishwashers, as well as insulation and weatherization in new and existing homes. Its non-residential programs provide on-site energy audits and promote efficiency in new construction as well as efficient space and water heating systems, clothes washers, food service equipment, etc. The utility also promotes self-generation of electricity through fuel cells that use natural gas or solar energy, as well as CHP systems if they do not employ diesel engines.

- Bay State Gas Company, one of the largest natural gas utilities in New England, provides on-site home energy audits with arranging services to provide warranteed contractor installation of recommended measures. The utility also shares the cost of insulation, clock thermostats, new high efficiency furnaces or boilers, and other residential efficiency measures. Bay State Gas also promotes a wide range of nonresidential efficiency measures including space conditioning systems, water heaters, process equipment improvements, control improvements, heat recovery measures, and others.

Q. Does Questar deliver any of the kinds of DSM programs these other utilities do?

A. No, but with one partial exception. I note that Questar does provide financial support for low-income home weatherization as provided for in Docket No. 99-057-20. The utility is not involved in delivering the weatherization program, but provided $250,000 in funding for 2001 to the Utah Department of Community and Economic Development, which administers the program. On April 15, 2002, the Division of Public Utilities (DPU) reported to the Commission on this program. The DPU concluded that the program saves gas cost-effectively, based on retail rates. The DPU also stated that the program enhances customer safety, reduces the emission of air pollutants and greenhouse gases, and provides other benefits. This appears to be a useful and cost-effective effort that should be continued. However, other DSM initiatives need to be investigated, developed, and implemented by Questar.

Q. In the jurisdictions you cited, how is the scope and content of gas utility DSM initiatives developed?

A. In each of the jurisdictions I discussed, regulatory commissions support DSM that is shown to be a cost-effective means of procuring the demand-side equivalent of supply-side natural gas resources. The utilities present evaluations of potential DSM in rate cases or special proceedings. Technology and market research are utilized to develop information about the cost and performance characteristics of DSM options. Other parties present their perspectives on utility DSM options, and after considering the need for and cost-effectiveness of DSM, the regulatory commission refines and approves the utility's plan for DSM. Finally, periodic independent evaluations are used to verify the impact that DSM programs have in the market.

Q. You indicated that technology and market research are usually needed to develop

information about DSM options. Is such research needed in Utah?

A. Yes, I believe it is. Questar has not demonstrated an interest in DSM in the past, and thus has conducted little of the kind of research that provides useful information for designing effective DSM. I would suggest that the Commission direct Questar to conduct a study of the potential for DSM in its service area. For example, a comprehensive demand-side management study could be modeled on the statewide Utah study of electric DSM which the Tellus Institute carried out in 2000/2001 for several parties who participated on the Commission's Energy Efficiency Advisory Group.

Q. Would the DSM program measures previously described in your testimony as having been undertaken by other utilities be cost-effective in Utah?

A. That is precisely the question that a comprehensive study of DSM potential would assess. It is interesting that utilities in widely varying parts of the country have found a broad suite of efficiency technologies to be cost-effective, but a Utah-specific analysis is necessary to identify cost-effective options for Questar and its customers. It is certain that some efficiency measures are cost-effective when their life-cycle costs are compared with any reasonable estimate of Questar's avoided cost of gas supply. For example, the highest efficiency residential water heaters, those with energy factors in the 0.62 to 0.65 range, cost very little more than gas water heaters of average efficiency, but conserve gas throughout their operating lifetime of ten or more years. Additionally, as noted above, the low-income home weatherization program funded by Questar is cost-effective, using retail rates as the proxy for gas avoided cost savings. Other measures are more costly -- for example the incremental cost of a high-efficiency residential gas furnace may be $600 or more above a standard efficiency unit. To determine whether the more expensive DSM measures are cost-effective, a careful analysis of the value of their savings needs to be conducted. That analysis in turn requires the utility to project its total costs of gas supply over a 10 to 20 year planning horizon, in order to provide a measure of the value of gas savings in reducing utility revenue requirements.

Q. Are specific mechanisms used to facilitate utility recovery of DSM costs?

A. Yes. In almost all jurisdictions where utilities have been explicitly authorized by regulators to pursue DSM, cost recovery mechanisms unique to DSM have been employed. The design of these mechanisms has varied, but most of them are structured to allow the utility to recover from ratepayers the actual amount spent on approved DSM programs.

Q. Why are special cost recovery mechanisms needed for DSM?

A. Utilities usually treat DSM expenditures as operating expenses. Once rates are set, every reduction in operating expenses is a contribution to the utility’s bottom line. This is an incentive for operating efficiency. In the special case of DSM, however, one wants the utility to expend the budgeted DSM program funds, for only if the monies are spent will efficiency gains be realized. A DSM cost recovery mechanism removes the utility’s incentive to spend as little as possible on DSM, because with such a mechanism unspent monies are returned to the ratepayers.

Q. In addition to considering the establishment of a DSM program cost recovery mechanism, should any other any other ratemaking reform be considered if the Commission desires to promote gas utility DSM?

A. Yes. I believe the Commission should consider how to address the revenue loss that Questar would experience were its customers to decrease their use of gas by taking energy efficiency steps through utility DSM programs. When I testified on electric DSM in Docket No. 01-035-01 I did not address the issue of lost revenues, because there will be substantial growth in electric load even after DSM succeeds in slowing the rate of load growth. But the rate of load growth on the gas side is lower, and it is therefore useful to consider whether and how to address the company's concerns about its level of revenues.

It may be possible to address this issue through program design. For example if the utility develops programs to promote on-site CHP at the same time as it promotes end-use energy efficiency, there may be little or no overall reduction in sales revenues. End-use energy efficiency -- again, the more efficient gas furnace is an example -- should and would reduce gas sales. CHP, on the other hand, reduces sales by the electric utility. Its impact on the gas utility would depend on the configuration of the CHP system, but in most cases new on-site CHP will increase Questar's net gas sales.

This issue could also be addressed through regulation to change utility business incentives relating to DSM. Because it decreases the amount of energy required to satisfy a given level of required energy service or comfort, energy efficiency reduces the volumes of energy sold by the gas utility. Most of the resulting lost revenue is offset by cost savings when variable costs are avoided --for example, the commodity costs of gas. The remaining portion of lost revenue, that which is not offset by variable cost reductions, represents pure earnings losses to the utility. Regulators in other jurisdictions have developed a variety of approaches to addressing this issue in order to promote utility pursuit of cost-effective DSM. The two most common approaches are the lost revenue adjustment mechanism, and the protection of revenues from short term sales fluctuations.

Q. How does a lost revenue adjustment mechanism work?

A. A lost revenue adjustment mechanism (LRAM) is based on the calculation of the amount of reduction in gas utility retail sales that is due to its own DSM initiatives. This must be calculated net of any energy efficiency trends that are occurring independently of utility DSM programs, for sales losses due to other factors would have been experienced even in the absence of DSM. The utility's lost revenue is then calculated, net of non-utility efficiency effects, and net of variable cost reductions from its own DSM. Lost revenue recovery is usually effected through the same procedure as is used for program cost recovery, e.g. a DSM tariff rider.

An LRAM removes the utility's short-term disincentive to decrease its own sales levels through effective DSM. The calculation of the amount of net lost revenues in connection with an LRAM is not as straightforward as is the simple accounting for expenditures that is required for program cost recovery mechanisms. In some jurisdictions independent measurement and verification is required to establish lost revenues for purposes of an LRAM. In others, the utility's recovery of lost revenue is constrained by an earnings test, such that the return on equity cannot increase more than some number of basis points above the allowed rate of return. In some jurisdictions there have been disputes over the correct amount of net lost revenues. With few exceptions, however, utilities have completely recovered the net lost revenues claimed by them under past LRAMs that I am familiar with.

Q. What other approach can be used to protect the gas utility from revenue loss due to short term sales losses?

A. Another approach to the revenue loss issue is to "decouple" revenues from sales levels between rate cases. This can be done through a revenue per customer mechanism. The levels of non-fuel revenue requirements that were authorized in the general rate case are divided by the number of customers, resulting in revenue per customer figures. Annual proceedings, incorporating mechanical adjustments, are made to modify tariffs so as to collect the authorized levels of revenues per customer. This periodically adjusts rates between general rate cases on the basis of customer growth. If per-customer usage decreases, the utility does not lose revenue. On the other hand, if per-customer usage increases, the utility does not gain revenue either.

CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your conclusions and recommendations in the area of tariff design.

A. In both their current and their proposed form, Questar's Rate G-1 and others of its tariffs feature volumetric DNG charges with declining blocks. The lower terminal blocks are intended to promote increased natural gas consumption. In order to encourage energy efficient practices and resource conservation, the Commission should flatten all volumetric rates in this case, thereby eliminating the declining block features. The Commission should also direct the Company to present inclining block volumetric rate designs in its next rate case. Inclining block rate structures send the price signal that increased usage is more costly, and that efficiency in the use of gas is a valuable practice. The inclining block designs that are presented in the next rate case should be so structured that the majority of customers would experience some consumption in the highest or "tail" block. This objective implies breaking rate G-1 into two rates, one for smaller users, the other for larger users.

The Commission should also direct Questar to increase the seasonal differentials in its DNG rates. Since the amount by which winter charges exceed summer charges at the present time is modest and does not reflect the degree to which winter seasonal demand drives DNG costs, I suggest doubling the differentials in this case. At the same time, the Company should be directed to present seasonal cost of service data in the next rate case so that the seasonal differential in DNG charges may be further refined based on pertinent information.

Finally, I note that the SNG and commodity charges in Questar's tariffs are not subject to serious rate design analysis in the short "pass through" proceedings in which those rates are customarily set. There may be good cost of service and energy policy reasons for considering new rate designs, such as an inclining block structure for commodity charges. I suggest that the Commission permit testimony in this proceeding that is limited to rate design for SNG and commodity charges, or state that it will include rate design as an explicit issue in the next "pass through" proceeding.

Q. Please summarize your conclusions and recommendations in the area of demand-side management.

A. DSM is cost-effective when the total cost of the efficiency measures (including the utility's program costs) is less than the utility's total cost to supply and deliver the gas that would be needed in the absence of the DSM. There are clearly opportunities to promote increased efficiency in the use of gas through cost-effective DSM programs. Additionally, gas DSM has air emissions benefits of reducing NO_X. Yet, apart from its funding of a cost-effective DCED low-income weatherization program, Questar has no DSM programs, and has not studied the potential for them. Therefore, I recommend that the Commission direct Questar to undertake a process of evaluating and developing appropriate gas DSM initiatives. In order to initialize DSM and lay a foundation for its development, Questar should be asked to undertake four parallel activities. These are:

- A comprehensive assessment of the potential for DSM based on customer usage patterns, market conditions, the projected long-run costs to supply and deliver gas (avoided costs), and the experience of other gas utilities which have pursued DSM. The study would develop cost and performance characteristics for a range of DSM measures and program options. It would specifically include market assessment of the potential for on-site CHP and other gas-fired distributed generation as DSM measures.
- At the same time, the Company should develop a basic DSM delivery framework that can accommodate those options which are found to be promising and cost-effective. The framework would consist of on-site energy audit services providing information and, where needed and cost-effective, incentives to promote customer adoption of energy efficiency measures. There would be two DSM tracks, one for the residential market, the other for the nonresidential market. The Commission should provide a time frame within which the company would conduct the DSM assessment and prepare its residential and non-residential DSM services for roll-out. The progress and findings of the DSM study would be used to decide what specific energy efficiency measures to promote through the new DSM services.
- Additionally, the Commission should take note of any company concerns about the near term costs of DSM to its business. Specifically, the company could be invited to prepare any proposal for rate making changes that it feels are necessary in order

to support DSM -- for example, a DSM tariff rider for the recovery of program costs.

- Finally, I suggest that the foregoing activities be conducted in a collaborative fashion. The Energy Efficiency Advisory Group the Commission established in Docket 99-035-10 has been an effective means of bringing together utility representatives, utility regulators, other state agencies, energy consumer groups, energy efficiency specialists, environmental interests, and other organizations concerned with the development of electric DSM. A similar process for gas DSM would help to apply the viewpoints and expertise of different parties to help develop DSM that is effective in design and attuned to market and regulatory realities in Utah.

Q. Does this conclude your testimony?

A. Yes, it does.