PUBLIC SERVICE ELECTRIC AND GAS COMPANY
REBUTTAL TESTIMONY OF
PETER A. CISTARO
VICE PRESIDENT – DISTRIBUTION

My name is Peter A. Cistaro. I am the Vice President – Distribution, Public Service Electric and Gas Company (PSE&G, the Company, Petitioner). In this case, I am serving as the Company's witness on gas utility operations.

This rebuttal testimony addresses a number of issues and recommendations raised by the Division of the Ratepayer Advocate's (Ratepayer Advocate, Advocate) witnesses in this proceeding.

The Advocate's witnesses have not taken issue with the quality of the Company's gas operations, our attention to safety, innovation, implementation of best practices, and our drive toward customer satisfaction. Yet the Advocate's witnesses recommended disallowances for the very programs that we have put in place to arrive at the currently favorable state of our gas operations. The gas utility needs to be allowed fair financial treatment to remove facilities from service that are obsolete, beyond economic repair, or potentially hazardous. We have established reasonable service lives for our mains, services, peaking plants and other distribution infrastructure based on our firsthand engineering and operating experience with these very same facilities. The Company wants to continue to bring its customers the advantages of the best technologies for safety and reliability and is proud to define itself as being committed to high quality and reliable service. To continue to do this, we need a reasonable and healthy research and development program. In addition, we need to be allowed to use industry established competitive compensation methods that help us to hire, motivate, and retain a workforce that wholeheartedly supports company goals to serve our ratepayers with the highest performance possible in the areas of safety, reliability and customer satisfaction.

Our business is installing, maintaining and operating a natural gas distribution system in a manner that continues to meet our customers' expectations for outstanding safety, operating and service performance. This requires that our regulators recognize that we cannot build upon our past excellent performance without proper treatment of the service life of our distribution facilities or proper compensation for our employees. These two things are the very foundation of our ability to provide safe, adequate and dependable gas service.

I have attached as Schedule 1 the Best Practice Benchmarking Reports provided in response to Staff request S-SE-2 for those areas in which the Company was selected as an AGA Best Practice Company in 1997, 1998, 1999 and 2001. Our employees are justifiably proud of these accomplishments and without question our customers are beneficiaries of these best practices and the many other innovations and advancements I have discussed in my direct testimony. I have also attached Schedule

2 that contains comparative data (OSHA incident rate, percent leaks responded to within one hour, cost per main leak repair, service leaks per mile of service, and regulatory complaints) for PSE&G and other gas utilities, including some from New Jersey. While geographic or other factors unique to particular utilities affect precise comparisons, this data demonstrates that our operations compare very favorably with other gas utilities. The positions taken by the Advocate's witnesses are simply inconsistent with these results.

While I can perhaps understand an aggressive revenue requirement position and role by the Advocate in this type of a proceeding, the connection between excellent operating results and the cost to achieve and continue them cannot be dismissed. It has been almost ten years since our last rate case. We have been holding the line against rising costs by utilizing technological improvements and innovative managerial approaches, but have come to a point where we can no longer continue to operate our Company as required, based on a revenue requirement that was established almost ten years ago. The Advocate's witnesses have totally disregarded the Company's achievements and accomplishments, and ignored our desire to continue on our present course. In my opinion, such a viewpoint has resulted in a revenue recommendation from the Advocate's witnesses that does not serve the interests of our customers, the residents of the communities we serve, our employees, the State of New Jersey, Board, or the Company with respect to a common objective of service excellence at reasonable rates.

DEPRECIATION ISSUES

The Advocate's witness, Mr. Michael J. Majoros, takes issue with service lives of many of our distribution facilities and the equipment that we use to serve our customers. We are trying to move from a gross average service life of all distribution plant to particular service lives for the various major components of our system that are more reasonable with respect to what we are experiencing in the operation and use of the facilities and equipment. In making his case, Mr. Majoros appears to misunderstand some of the basic applications and use of the facilities and equipment and the influence of standard industry practice on the physical attributes of the in-service facilities and their resulting durability. The service lives that we have established in working with Mr. Roff are not arbitrary, but have a solid engineering basis backed by years of experience in operation of these facilities. These are much more than back of the envelope estimates, as inappropriately characterized by the Advocate's witness. (Majoros page 26). I will cover my comments on depreciation in two general categories: Mains and Services and Gas Peaking Production Plants.

Mains and Services

On page 15, lines 11 and 13, Mr. Majoros states that "The metallic mains and services are left in place... (and) they continue to provide service". These statements are incorrect and indicate a lack of understanding on Mr. Majoros' part of gas distribution operating practices. Because plastic mains cannot by themselves be detected with pipe locating equipment because they are not metallic, all direct buried plastic mains and services are installed with a 12 gauge metallic locating wire next to them. This locating wire is required by the Federal Department of Transportation 49 CFR 192.321(e), which is enforced by the NJ BPU. This is standard practice on both new main installations and replacement main installations. On those installations where we are able to insert mains, about 15% of all replaced mains, we use the metallic pipe being replaced as the "metallic locating" device only. This saves the cost of installing a locating wire. The abandoned main is obviously no longer capable of safely transporting gas (this is why it was replaced) and its incidental use as a locating device cannot reasonably allow it to be considered to be "in service." Mr. Majoros' recommendation is based on an erroneous fictional understanding.

On page 16, lines 1 and 2, Mr. Majoros states that "But in reality the metallic main and service are not removed..." The cost of removal for main is the cost to safely abandon mains - not remove them from the ground. We are not aware of any gas distribution company in the nation that removes the abandoned main facilities from the ground. The costs associated with complete removal would be significantly greater and could approach or exceed the costs of installing the new pipe because of the labor and repaving costs. This is an indication of a lack of understanding on Mr. Majoros' part of gas distribution operating practices. The dollars charged to Cost of Removal accounts are the costs for the abandonment of services (approx 60%) and for the abandonment of mains (approximately 40%).

The following table is a step by step list of the typical activities involved in the replacement of a main, other than by insert.

	WORK	ACTIVITY CHARGED
1	Install the replacement main	Replace Main
2	Tie-in one end of the replacement main to the system to get gas in it	Replace Main
3	Transfer plastic or protected steel services from the old main to the new main	Replace Main
4	Renew old bare steel services and transfer to new main	Replace Service
5	Purge the gas, seal ends, and abandon old main	Cost of Removal
6	Tie-in remaining end of the replacement main to the system	Replace Main

As shown on the stable, only step 5 results in charges to cost of removal. I note that although costs for abandonment are small relative to the cost of installing the replacement main, on the order of 3 to 5%, the costs for abandonment are significant when compared to the dollars retired.

The Crew leader determines the amount of time and material charged to the abandonment of the facilities at the time the work is performed, based on the effort involved. The effort will vary from project to project based on the size of the facilities (4" mains or 16" mains) and the complexity of the distribution system at that site. The cost of removal for main is the cost to safely abandon mains - not remove them from the ground.

For services (service lines go from the main to the house or commercial structure), only the costs associated with complete abandonment, meaning discontinued gas service, are charged to Cost of Removal. The procedure for cutting and abandoning idle services has been discussed with the BPU Pipeline Safety Staff for a number of years, and was recently revised based on their recommendations. We are not charging transfer or renewal of active services to the Cost of Removal account because the labor element for cutting and abandonment in place is small relative to the installation of the replacement service. Abandonment of a service where gas customers have discontinued their account requires that a crew be mobilized and make an excavation dedicated for the sole purpose of abandoning the service, and this project cost is then charged to Cost of Removal.

Mr. Majoros is incorrect when he states that abandoned mains and services "continue to provide service and should not be retired" and that the Company's cost of removal on its books is "the result of an arbitrary assignment of part of the replacement project cost."

I also take issue with the service life of mains and services proposed by Mr. Majoros. We examined the ages of the cast iron main segments retired in each year from 1993 to 2000, by the footages retired during those years. The following table shows the weighted average age of the original installed years for the mains replaced in each of the last eight years, and gives an indication of the average age of the mains being replaced.

Year Of Retirement	Weighted Average Year For Original Installation Date	Average Age
1993	1931	62 years
1994	1932	62 years
1995	1935	60 years
1996	1931	65 years
1997	1938	61 years
1998	1932	66 years
1999	1935	64 years
2000	1937	63 years

Additionally, nearly all new and replacement mains are plastic. Approximately one third of our active mains are plastic, with an estimated life span of 50 years (see Schedule 3).

Given the average age of the retired main shown above, and the current mix of plastic pipe, it would appear that Mr. Roff's proposal of 60 years is more reasonable than Mr. Majoros' use of 75 years.

Production Plants

Mr. Majoros has proposed that the service lives of production plants be extended by ten years "based on my judgment" [Page 27, lines 19 through 23 and line 28]. However he has not indicated that he has any operating or engineering experience nor detailed knowledge of these type of plants to warrant the proposed life extension. A partial day visit to these plants does not give him the equivalent comprehensive engineering and operating knowledge of the personnel who work with these facilities day in and day out. His statement that "These new plants are state of the art, …" (page 27, line 29) is incorrect. Even though Harrison and Central had major upgrades in 1992, (replacing most of the 1950's vintage equipment), they are now almost ten years old and their control equipment is certainly not state-of-the-art with today's technology. The other plants, as shown below, are working with equipment that was installed in the 1970's. These cannot be called "state of the art" process equipment in any sense of the phrase.

- Some information on each specific plant:
  - ♦ Harrison and Central - The foundation for these facilities, the 64 propane storage tanks, were not replaced during the 1992 upgrade and were originally installed in the early 1950's. The tanks are a significant part of the plant operation and the plant would be useless without them. The process control equipment is almost ten years old and although

functional, is not state-of-the-art. The Company proposed 2017 retirement date was developed at the time of the major upgrade in 1992 and considered all of the above in determination of that date. No major changes have occurred to the plant since that time to warrant an extension of the retirement date as recommended by Mr. Majoros.

- Linden - This Plant was constructed in 1973 and is used only for propane storage. The 11 propane tanks, compressors, unloading facilities, piping, and valves are all the originally installed equipment and are now nearly 30 years old. The Company proposed 2010 retirement date will give this facility a 37-year life span and should not be changed. To accept Mr. Majoros' recommendation to add an additional ten years on the life span of this facility is not wise or practical unless one's objective is to arbitrarily reduce the Company's rate request.

- Camden - This Peaking Plant was constructed in 1972 and still includes much of the originally installed equipment except for some instrument/control system improvements and propane pump replacements. All of the major components: vaporizers, compressors, coolers, piping, valves and the 10 propane tanks were installed in the early 1970's. The Company proposed 2010 retirement date will give this facility a 38+-year life span and should not be changed to the 48-year life span as recommended by Mr. Majoros.

- Burlington - This liquid natural gas (LNG) plant was constructed in 1972 and still includes all the original installed equipment except for some minor instrument improvements. All of the major components: pumps, vaporizers, compressors, coolers, odorant system, piping, valves, unloading facilities, buildings and the LNG tank were installed in the early 1970's. The Company proposed 2010 retirement date will give this facility a 38+-year life span and should not be changed to the 48-year life span as recommended by Mr. Majoros.

As the above information indicates, the determination of the retirement dates as presented in our petition and as described in the internal memorandum shown as MJM-5, were based on solid information and data and not as described in Mr. Majoros's testimony as "...on the back of an envelope approach" (Majoros page 26, line 35).

RESEARCH & DEVELOPMENT (R&D)

PSE&G is very committed to incorporating the latest technologies into our work methods and aggressively supporting research and development efforts that hold a promise of contributing to the safety of our system and to the safety of our employees and customers. We are reassured that Mr. Henkes sees the value in continuing to support research related to our distribution activities as FERC-authorized funding is being withdrawn from the Gas Technology Institute (GTI) and continuing into the future.

PSE&G is very committed to incorporating the latest technologies into our work methods and aggressively supporting research and development efforts that hold a promise of contributing to the safety of our system and to the safety of our employees and customers. We are reassured that Mr. Henkes sees the value in continuing to support research related to our distribution activities as FERC funding is being withdrawn from the Gas Technology Institute (GTI) and continuing into the future but can not understand why he would all but eliminate our current R&D program outside of GTI in order to accomplish this. My testimony has detailed the many ways in which R&D efforts, discoveries and developments have brought benefits in safety, productivity and financial control. All of our internal and externally funded research is for projects that hold a high potential for benefits to PSE&G's operations. PSE&G's small group of R&D scientists and engineers have done a remarkable job in transforming our gas utility from low tech to high tech. They have helped us to hold the line on costs and to bring innovation literally to our customers' door. To withhold resources to evaluate and test new technologies, demonstrate effectiveness, and adapt projects to meet our Company's requirements, is to weaken the transfer of new technologies into our operations and disregard our customer's needs for economic and safe utility services for the future. I must insist that we get full consideration and support to continue the modest R&D program that we have in place in addition to receiving replacement funding for GTI R&D

We are also very concerned, because Mr. Henkes did not include the portion of funding that we requested for gas transmission research. PSE&G operates 73 miles of intrastate transmission main that is subject to the same safety regulations as the larger interstate pipeline operators. Much of our transmission main is in the metropolitan area in and around Newark, and we are very committed to maintaining this high pressure gas line with state of the art tools and technology. We are subject to increasingly rigorous operating requirements for internal inspections, operator qualification and remote shutdown capability and feel that new methods and deployment of new technologies in transmission pipeline operation will truly have a beneficial impact in terms of safety and cost control for our transmission system. R&D program areas at GTI for transmission pipeline operation are:

1. In-Line Inspection of Pipelines

2. Pipeline Integrity
3. Transmission Gas Measurement

Research and development projects for gas transmission pipeline operations hold definite future benefits for our organization, and we strongly feel that it is vital to pursue transmission R&D projects at the funding levels that GTI has established in order to develop timely results that we can use. The total dollars which we are requesting for transmission research is $278,100, or 13.1% of the test year GTI contribution of $2,122,898 that came from the FERC surcharge. This percentage is the amount that GTI directs toward transmission R&D programs from their FERC surcharge funding GTI has an excellent track record of driving results from their budgeted levels of project funding, and PSE&G has been the beneficiary of these results in many aspects of our operations, as I have described in my previous testimony.

PSE&G currently spends close to one million dollars on research that is of particular interest to us as a gas company, but which does not get funded through GTI and the FERC surcharge mechanism. One of these projects which we are supporting as a gas company is development of fuel cells that use natural gas as a fuel. This gas-related research cost the Company $24,000 and is being conducted by EPRI Solutions, which is part of the EPRI organization. While it is true that this is a technology which will have an impact on electric industry, as Mr. Henkes rightly points out on page 66 of his testimony, it is our interest in gas becoming the fuel driving the technology that has our attention. We have had some difficulties in the past with deployment of new customer end-use technologies that required either very pure natural gas, had difficult service requirements, or were very pressure sensitive. When a device has the potential to be deployed on a large scale within our service territory, we want to be sure that the development of the device has a maximized compatibility to our gas operations. We do not want to repeat the difficulties that we had with the initial implementation of high efficiency furnaces and their venting requirements, stationary natural gas engines and their gas quality requirements and compressed natural gas vehicles and their special compressor requirements. While all these problems with the aforementioned technologies have since been worked out, these were aspects of new technologies being deployed where the customers' safe operation of equipment had not been adequately addressed in the R&D stage. Other companies that are co-funding this research at EPRI Solutions are Southern California Gas Company, Tokyo Gas Company, Gas Natural SDG, S.A., Barcelona, Spain, Consolidated Edison Co. of N.Y., N.Y. State Gas &Electric Co., Central Hudson Gas & Electric, Exelon Corp., Alliant Energy Corp., City Public Service of San Antonio, Northern Indiana Public Service Co., and Wisconsin Public Service.

Although the dollar amount is small, $24,000, we are concerned that the Advocate's witness has recommended a disallowance of this research solely because

EPRI is the organization that is conducting the project. This appears to be arbitrarily discriminatory given the relevance of the research to our gas business concerns. While we realize it seems odd that ratepayers on the gas side of the business would be paying EPRI dues, we feel we should be encouraged not discouraged to pursue advantageous gas opportunities where they may present themselves and moreover that is fair to assess some of the overhead of EPRI research back to gas ratepayers if gas is sponsoring and taking the lead on the research project.

COMPENSATON PROGRAM

The utility industry, and Corporate America in general, has undergone significant changes over the past two decades. One of the more sweeping changes in business philosophy over this time has been reflected in the widespread implementation of "pay-for-performance" compensation programs. By design, these programs enhance opportunity and risk as well as accountability for employees. Most cost conscious, modern organizations today determine competitive total annual compensation for comparable positions in the relevant labor market (not just base salary level) and place a portion of total pay at risk which is contingent upon the achievement of performance-based goals to the benefit of customers and shareholders. The plans are implemented with the intent of aligning employee behavior with key business goals, with results that include improving employee productivity, operational efficiency, and customer satisfaction. Properly designed incentive programs are critical for employee retention strategies as well as for attracting new competent talent. A company without an incentive compensation program today clearly is at a disadvantage. In our response to SRA-65 (Schedule 4), the Company submitted several compensation surveys that demonstrate that this change to incentive compensation is becoming widely adopted by most industries because of the positive results they yield. According to the report by William M. Mercer, Inc., a recognized leader in compensation surveys, "incentive compensation prevalence is increasing within even non-profit organizations." Of the 1,200 firms surveyed by Mercer in its report, 79% had incentive plans for their employees. Like PSE&G, nearly half of those companies have increased the number of employees eligible for participation since 1997. These numbers become even more profound when related specifically to energy companies. Of those companies, 97% had incentive plans for their executives and management personnel, 93% opened them to Professional/Technical employees while 87% made incentive compensation available to non-exempt employees. The evidence is clear that US industry has embraced incentive compensation or "pay at risk" as a standard component of total cash compensation management which has become an effective, mainstream way to vary annual pay with business and operating results.

As described throughout my direct testimony, as well as in Mr. Stellwag's testimony, our over-riding objective in PSE&G's operations is to drive safety, productivity, and excellence in our gas operations. My testimony clearly shows we have been highly successful in that objective. It is critical for the Judge, the Staff, the Advocate and the Board to understand that we cannot do this without a workforce that shares an interest in these objectives. We have pursued multiple paths to assure these goals get accomplished, and one of the most successful ways of communicating the importance of these goals to our employees has been to carve out a portion of their "regular base pay" into an "at-risk portion" of their annual compensation that is directly tied to their individual and collective performance. Every non-bargaining unit employee of PSE&G has this performance-based component of their compensation. Each eligible participant has to meet their individual minimum performance expectations in order to receive any of this at-risk pay.

<u>Performance Incentive Plan (PIP)</u>

In 1995, we committed to phasing in the Performance Incentive Plan (PIP) from just a few upper level managers to all non-bargaining unit employees. The strategy here is that incentives should be integrated into total competitive compensation, not an additive feature to existing salaries. Specifically, in 1996, we held back the amounts of annual merit increases to "regular base pay" as a way to fund the new variable pay opportunity without increasing regular total cash compensation.

Concurrent with this strategy, PSE&G embarked on a comprehensive external pay study for all positions to compare our pay levels with those found in both energy service firms as well as general industry. The Company did not merely "add-on" incentive opportunity, but transitioned into a total compensation structure by targeting total pay (salary plus incentives) to the relevant marketplace while reducing the fixed compensation component of total pay.

Prior to introducing "pay at risk" compensation throughout the Company's management and administrative workforce, the Company realigned its total compensation program with industry standards. The result of that review was that 43% of employees had their job value reduced, 55% stayed the same and 2% were raised. Although this was quite a financial and emotional adjustment for most employees at the time, we needed to go through this in order to properly shift to a competitive mix of compensation that now would include both a fixed portion (base salary) and a variable portion (pay at risk) relative to the competitive external marketplace.

PSE&G had successfully implemented performance incentive pay (PIP) for upper level managers below the officer level in 1989, and following the alignment of job values and the base pay in 1995, senior supervisors and mid-level managers became eligible for PIP in 1996. Although the PIP was payable the following year (1997), the merit salary increase allocations were reduced to 1% in 1996 for this new group, vs. the 4% industry standard for that year. The following year, the PIP targets were increased to shift more compensation to "variable pay" or "pay at risk" for existing participants and the program was extended to encompass all non-bargaining unit employees In 1997, the merit salary increase budget was again reduced, this time by 50% - so that total compensation remained in the competitive range of external pay levels found in the marketplace. In 1998, support staff employees were included in the PIP bringing the total participation to 100%. I have attached Schedule 5 which depicts the phase in of this program.

By managing total annual cash compensation in this way, we were able to maintain a market competitive pay opportunity, while reducing regular increases to our direct fixed costs (associated with base pay) as well as indirect costs such as benefits which are often a function of base pay levels.

PSE&G's transition to variable compensation tracks to industry patterns as can be seen in the attached chart, Schedule 6, that shows results of a survey conducted by Hewitt Associates of industry compensation practices. The analysis shows the rapid growth of incentive compensation in industry as a percentage of payroll as well as our transition into pay at risk compensation. As I said earlier, a competitive total compensation pay structure allows us to compete for qualified employees as well as to provide reward and recognition systems to retain the services of highly trained and qualified associates

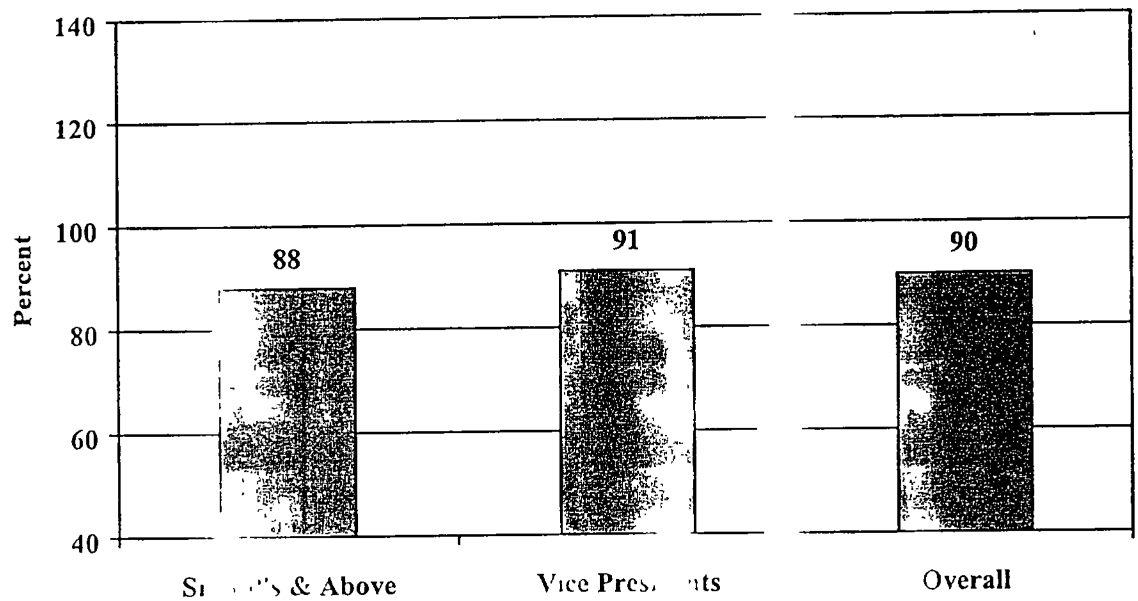
The cost effect of introducing PIP was mitigated by our overall base pay management through lower annual merit increases in 1995, 1996 and 1997. Contrary to fixed base pay, PIP has to be re-earned every year, and poor performers do not hold any entitlement to it. Schedule 7 shows a typical PSE&G employee's compensation, starting in 1992, with the average merit increases for each year and the targeted PIP for that year Total annual cash compensation, which is how the Company benchmarks itself to other utilities, and general industry companies, has annual growth rates of 4% for the last two years shown and is only slightly over that amount compounded over the eleven year period shown The PIP compensation portion does not literally "add" to the fixed base level increase (it is not 4% Base, plus 10% PIP) as one might mistakenly think when first hearing about the performance incentive compensation concept. Rather PIP is a portion of the overall compensation amount that is at risk. If an individual performs consistently on "target", they would receive the average 10% PIP award at the mid-level manager level. The year-to-year increase in base pay and PIP is, in reality, comparable to what the "regular" base salary increases, - or 4% to 4.5 % compound annual growth, would have been had the

Company not implemented the PIP plan, as demonstrated in the Schedule. Our compound growth rate in this example compares well with industry data.

Management Incentive Compensation Plan (MICP)

We administer an executive compensation program for PSE&G officers, the Management Incentive Compensation Plan (MICP), that is similar to the PIP. MICP is based on operational results in the areas of safety, customer satisfaction and cost control and is balanced by an earnings contribution to corporate results. Each PSE&G officer has a set of individual operational goals to which their respective department employees' PIP goals are linked. If one of the operational goals is not achieved, the employees see a reduced portion of their PIP and the Officers also see a reduction in their MICP. Similar to the MAST group, PSE&G does extensive benchmarking on compensation to officers. PSE&G targets total compensation at the 50th percentile of large electric and gas utilities as well as general industry levels where applicable. The chart below shows our compensative positioning for the year 2000 for executive level positions. It indicates that "PSE&G's officers are compensated approximately 10% below target for the year 2000.

PSE&G Total Cash Compensation Compared to Competitive Levels



<u>Long-Term Incentive Plan (LTIP)</u>

The LTIP is the sole compensation program that is exclusively related to the value of the stock and it is designed to motivate and reward executives for successful operation of their respected business over the longer term so that PSEG as a whole is successful. Stock option grants form the basis of the LTIP with the overall objective to encourage participants to increase their ownership in PSEG's common stock. The Company takes a total compensation market based approach to determine competitive pay levels for positions in the energy services industry and determines the amount of pay, if any, that would be delivered in the form of long-term compensation. Long-term compensation opportunity is a normal part of total compensation found in today's business environment and is a significant factor in recruiting and retaining key employees.

The LTIP applies to a very limited number of individuals and the associated costs are minimal (LTIP administration and brokerage commissions run about $20,000 annually). It is important to understand that the MICP and PIP are annual incentive plans which are structured to recognize operating measures which include customer service and support, safety and gas leak response time, etc. These programs are significantly different than the relatively small LTIP and should not be "lumped together" as is the case in Mr. Henkes' testimony.

Since 1998, only non-qualified stock options have been granted under the LTIP. Options only have value when their market value exceeds the option price at date of grant. There is no charge to earnings (no cost) in the granting of an option under the LTIP. Currently, many options are "underwater" (have no current monetary value).

<u>Performance Scorecards and Goals</u>

The most important aspect of the PIP is that it gives us a tool to give employees a personal stake in each department's "scorecard" of key operational measures that are tied to business unit goals. These measures vary by department, but for almost all groups the emphasis is directly on safety, customer satisfaction and cost control. We sh[illegible] these results with emplo[illegible] every month so that they can see if their collective [illegible]forts are succeeding or sh[illegible]ng. The PIP [illegible] an effective team builder, align[illegible] [illegible]epartments towards co[illegible] goal[illegible] that are important to both our company and [illegible] ratepayers. Some of the [illegible] that have been on the "scorecard" for our gas emplo[illegible] this last year were numb[illegible] OSHA incide[illegible]s, number of motor vehicle accide[illegible] cost control as me[illegible] by productivity and adherence to operating bud[illegible] use of overtime, custome[illegible] [illegible]plaints, customer satisfaction survey results, respon[illegible] [illegible] to leaks, and fixin[illegible] the [illegible]blem right the [illegible]st time.

O[illegible] executive compensatio[illegible] PSE&G offic[illegible]s, the Management Incentive Com[illegible]sation Plan (MCIP), is [illegible] [illegible]ar to the PIP in that it is tied to operational res[illegible] [illegible] the areas of safety, cust[illegible]r satisfaction a[illegible]d cost control. Each PSE&G office[illegible] [illegible]s a set of individual ope[illegible]ional goals to w[illegible]ich their respective department em[illegible]ees' PIP goals are linked Depending on how well the operational goals are achi[illegible] [illegible]ll non-represented employees, from clerk[illegible] to Vice Presidents, will see a propo[illegible]onate difference in their [illegible]tive PIP or MIC[illegible]

A[illegible] example, I have attached my own MICP goals, the PIP goals for my departmen[illegible] [illegible]ployees, a Division scorecard that transl[illegible]es these goals into department obj[illegible]ves, and finally the dril[illegible] down of each objec[illegible]ve into action items with specific a[illegible]ntability for each non-represented employee in the Districts. If we take my goal [illegible] [illegible]e 8 on improving sa[illegible]ety, for ex[illegible]mple, yo[illegible] see it appears in two places on my g[illegible] cts' safety at the co[illegible]orate leve[illegible] in my department. I picked employ[illegible] s[illegible]ety because it is o[illegible] number [illegible]. We believe that concentratio[illegible] improvement in employee safe[illegible] ds system safety and reliability and [illegible] the safety of our customers [illegible] the [illegible]eral public. This is because, as [illegible]r, I must work as a team wit[illegible] Officers to promote safety through[illegible] organization as we[illegible] as driving [illegible]lts within my group. The PIP goals [illegible] non-represented employees in [illegible] department on Schedule 9 for safety are cle[illegible] [illegible]nificant piece of this group's a[illegible] [illegible]nsation. A scorecard that was developed [illegible]r the Divisions Schedule 10 ref[illegible] goals and measures for the employees [illegible]hat workgroup as it relates to [illegible]llmen[illegible] of this goal. Finally, Schedule 11 show[illegible] e actual action items and acco[illegible] these employees can clearly understand t[illegible]ir part in moving t[illegible] departme[illegible] [illegible]n meeting the stated goals and truly bec[illegible]ing a "safe and productive ener[illegible] [illegible]eam".

Prior Case Regulat[illegible] Treatment

As st[illegible] throughout my r[illegible]buttal test[illegible] th Company employs a total cash compens[illegible]on philosophy for [illegible] executiv[illegible] [illegible]ent and professional employees. Tha[illegible] philosophy, meani[illegible]g the tot[illegible] [illegible]f all elements of compensation, inc[illegible]ng base salary [illegible]nd incen[illegible] [illegible]ms are taken into consideration whe[illegible] [illegible]mparing PSE&G [illegible]nagemen[illegible] [illegible]sional compensation levels to the market The Company's application of [illegible] phy was extensively reviewed in the Company's prior base rate case and [illegible] uated and supported by the BPU Management Audit of 1991

Specific evidence of the BPU's supp[illegible] Company's incentive compensation programs can be found in the Manag[illegible] Report prepared for the Board by Richard Metzler & Associates in Dock[illegible]030243 (Section X, pages 146-149) attached as Schedule 12. Among the [illegible] report's findings were that the "officer compensation is well designed and [illegible] the market..." They further went on to state that the following aspects of [illegible] ation <u>program were found to be good.</u>

- Greater officer and management compensatio[illegible] variable/put at risk during the past several years
- Documentation of the compensation programs [illegible] d incentive programs – is good
- The incentive compensation program includ[illegible] ny performance test that ensures that payments are highest only whe[illegible] pany does well

The BPU Auditors further went on [illegible] hat the Company's Management and professional Compens[illegible] on Progr[illegible] well designed and in line with the market (Section X-40) Here, again, [illegible] the management and professional employee group salary plan to be prope[illegible] with several notable characteristics, stating that "A greater percent of to ... ion has been made variable – dependent upon the Company and individu... ...e."

Most noteworthy was a stateme... that ... llowing features of the PIP program to be good

- The payout is dependent upon the Comp...y's ...
- Individual awards are based upon the ac...ven... ...ual goals

(Schedule 12, page 4)

I also note that Mr. Henkes beginning ... of his testimony has relied upon the Jersey Central Power and Li... Co... ...on in Docket No. ER91121820J in February 1993. I would like to s... ...re are considerable differences between the incentive plans of JCP&L ... that time and those currently in place at PSE&G. Most important... the ... ...s report on JCP&L indicated that incentive payment awards were in addi... ...se salary and merit pay that each eligible JCP&L employee received. Th... ...n, unlike PSE&G's plan, provided incremental compensation, not ma... ...ompensation. The Auditors also indicated that the eligibility for the Ince... ...for both officers and management (which was at the Director's level and ... at the discretion of each subsidiary President

In contrast to the JCP&L plan, the plans ... are largely focused on customer satisfaction and safety. Our plans are no... ...ry but include every non-represented employee of the Company [illegible] tegral part of the Company's overall cash compensation philo [illegible] phy [illegible] rgets a market-based compensation which also places a percentage [illegible] ov [illegible] sation at risk each year

Our overall incentive programs [illegible] we [illegible] and approved as appropriate by the Board's Auditors, the overall [illegible] phy of incentive compensation has been approved by previous Adv [illegible] ses and the Board should now find that the continuance of these [illegible] og [illegible] nu to represent valid components of providing safe and adequate [illegible] vice to [illegible] ners here in New Jersey

Compensation Conclusion

The Company's compensation program [illegible] of "total cash" compensation As supported above, this "total [illegible] h" co [illegible] in line with Corporate America and instills a "pay at risk" component, [illegible] relates to employee performance, and benefits the customer. When [illegible] ne Com [illegible] orms compensation comparisons within the industry it is the "total [illegible] sh" [illegible] n that is compared to other utility companies These compensation comp [illegible] s demonstrate that the company's compensation levels are within the [illegible] orm fo [illegible] stry. As such, the com ens portion related to performance NO a portion to overall com en ut instead an integral part of l c m seems ironic that if the Com d l not er nt a performance based p o compensation, but ins ple base only com ogram, our payroll would b to industry peers, and he d recovery in base rates re ve h Company taking progress to implement a performan , with "pay at risk with Corporate America pro the salary with dependen performance items like custo satisfaction tivity, safety and reliability system. Mr Henkes is nce portion be disallowe is this portion, which is le th ms by which the consumer ts This shows how unreas le this dis would be. We disagree ly with Mr Henkes and be are known the Judge an will agree, that the com tion ce is fair and reasonable yields consumer benefits the re reason recovery in base rates

The Company has provided v t dge and BPU that 1) the Co 's total compensation is in l th ts pe rformance awards are availa the entire team of non-rep l emplo nc just executives, 3) perf ma ards are part of an inte m am, not additive bon formance a ards are tied rma ge the customer ber formance a d do not y a increases that are t nent with dustry standa 6) t y did not have per wards bu tead ha nsation, while con sa levels wou be the sam es btedly not be cha r operating ncrease no

BEFORE THE TENNESSEE REGULATORY AUTHORITY
NASHVILLE, TENNESSEE

IN RE:	)	
	)	
PETITION OF CHATTANOOGA	)	
GAS COMPANY FOR APPROVAL	)	DOCKET NO. 04-00034
OF ADJUSTMENT OF ITS RATES	)	
AND CHARGES AND REVISED TARIFF	)	

ATTACHMENT TO
GAS TECHNOLOGY INSTITUTE'S RESPONSES TO
CHATTANOOGA GAS COMPANY'S
DATA REQUEST NO. 3 – PART TWO

Filed Session of February 09, 2000
Approved as Recommended
and so Ordered
By the Commission

DEBRA RENNER
Acting Secretary

Issued & Effective February 14, 2000

STATE OF NEW YORK
DEPARTMENT OF PUBLIC SERVICE

January 31, 2000

TO: THE COMMISSION

FROM: OFFICE OF GAS AND WATER

SUBJECT: CASE 99-G-1369 - Petition of New York Gas Group for Permission to Establish a Voluntary State Funding Mechanism to Support Medium and Long Term Gas Research and Development (R&D) Programs.

SUMMARY OF RECOMMENDATION: Staff recommends that the Commission should modify a proposal by gas utilities and allow an alternative funding mechanism to replace the existing funding and research and development by the Gas Research Institute.

SUMMARY

By letter dated October 4, 1999 the New York Gas Group (NYGAS)[1] petitioned the Commission to establish a voluntary state funding mechanism to support medium and long term gas research and development (R&D) programs. This funding mechanism would replace the Federal Energy Regulatory Commission (FERC) surcharge used to support broad-based gas related R&D conducted by the Gas Research Institute (GRI)[2]. By agreement, between

[1] The New York Gas Group (NYGAS) is a gas utility trade association comprising the 10 largest natural gas utilities in New York State, who deliver 95% of the gas used in the state.

[2] GRI is the national gas research organization founded in 1976 with approval of the FERC. GRI's mission is to discover, develop and deploy technologies and information for the benefit of gas customers and the industry.

FERC and the interstate gas pipelines the GRI surcharge is being phased out over the next several years. Since the proposed surcharge would replace the GRI surcharge, there would be no net impact on customers' bills.

The amount collected under the NYGAS proposed funding mechanism would mirror the decrement in the FERC surcharge each year until 2004 and will be capped at $0.0174/dekatherm, thereafter.[1/] Staff recommends that the petition be approved with two modifications, discussed below.

BACKGROUND

Since 1978 a significant portion of gas related R&D has been performed by GRI. This work was funded by gas consumers through a FERC approved surcharge on interstate pipeline deliveries. FERC would review GRI's program and funding request each year and approved the level of this surcharge. In 1998, FERC approved an agreement among all sectors of the natural gas industry, to gradually reduce and eliminate this surcharge by 2004. As the industry moves toward competition it was determined that mandatory funding of GRI should be replaced by voluntary support by LDCs, pipelines, producers, or others who determined that the R&D performed by GRI was beneficial to them. After 2004 GRI's funding will be entirely on a voluntary basis, by any entity that wants to participate in the R&D programs.

Historically, research funded through the GRI surcharge was broad based. GRI's work ranged from the conceptual stage through product development; projects were often long term. Internal LDC R&D programs, on the other hand, addressed specific company needs. Internal programs, funded in rate base, concentrate on projects that are near the end of the R&D cycle.

1/ After 2004 when this surcharge reaches the maximum amount and the GRI surcharge is gone, consideration could be given, as part of a rate case, to moving these dollars into base rates in order to eliminate the need for a separate surcharge. In the interim period, when the dollar amounts change every year, the surcharge represents the most convenient method for funding this R&D.

Internal projects are the final field testing and demonstration of appliances, and new technologies that are almost to the point of commercialization.

NYGAS states that gas R&D programs have provided significant ratepayer benefits. Benefits to costs analyses that the utilities have performed on past programs show at least $3 of benefits for every $1 invested in gas R&D. In addition, continued support for medium and longer term research programs will ultimately benefit shorter term development and demonstration projects that will continue to be funded separately under internal LDC gas research budgets. Over the past five years, due to the changes experienced throughout the gas industry, both a majority of the LDC's internally funded R&D programs and the overall level of GRI funding have been reduced.

NYGAS PROPOSAL

NYGAS proposes that the individual LDCs be allowed to impose an R&D surcharge on firm[1/] sales and transportation customers to support medium and long term gas R&D. The LDCs would be allowed to set the amount of the surcharge, up to the decrement in the FERC approved GRI surcharge. During 1998, the year used as a base for this proposal, New York gas consumers contributed roughly $15.5 million to support GRI's program. The sum of the GRI contribution plus the amount collected through NYGAS' proposed surcharge would remain constant. In the year 2004, when the proposed plan is fully implemented, the amount of funds to be used for research up to the $15.5 million would be totally under control of New York LDCs.

Upon approval of NYGAS's petition by the Commission, LDCs could file new tariff leaves that would include an R&D surcharge that would not exceed the decrement in the FERC surcharge. LDCs will use deferral accounting to insure that the

1/ The surcharge will not be placed on interruptible sales or interruptible transportation. These tend to be market based transactions, and as such the addition of the surcharge could drive these customers off the system.

funds collected through the surcharge mechanism which is not spent on R&D programs will be refunded to gas consumers.

Each LCD would be responsible for planning, implementing, and managing R&D projects funded by this proposal.[1/] These projects would be tracked separately from each LDC's internal projects. The R&D projects supported by this proposal would be limited to projects that are medium to long term in nature (i.e., projects that are at least twenty-four months or more from becoming a commercially deployable product). R&D that falls into this category tends to be more in a conceptual or basic research stage; it is riskier, meaning that it is harder to find support as it is far from producing a marketable product; it also tends to be the most expensive part of project development. Internal RD&D projects, or research currently funded through rates, tend to be restricted to projects nearing commercialization. This has become necessary, of late, as limited funds dictate that results are more certain. Projects nearing the end of the R&D cycle tend to have more support from manufacturers and have a greater likelihood of demonstrating that there will be tangible benefit to both the company and the consumer.

In order to address common needs and avoid duplication, the individual LDCs will collaborate, much in the same way that they do currently, through GRI, NYGAS and other research consortia. To insure a suitable level of collaboration and maximize the benefits to NYS ratepayers, NYGAS initially proposed that at least 30% of the total dollars collected through this surcharge be used in projects having two or more cofunders. Such cofunding reduces the risks posed by long-term R&D projects. After discussions with staff, NYGAS revised its proposed cofunding level to 60%.

Attached as Appendix A is a list of program areas that NYGAS has designated as "Vital Research and Development Program

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1/ Some of the funding may go to support projects conducted by GRI. However, that will be discretionary by the LDCs.

Areas". NYGAS provided this list as an example of program areas to be funded through the surcharge mechanism. The program areas include: pipe installation, repair and maintenance, supply, system analysis, end-use applications, and environmental. To monitor these projects and to aid in our oversight of these funds, NYGAS would create a web-site for technical and financial reporting on funds collected and used through this mechanism. Technical information for each project would include a statement of objectives, milestones, deliverables, schedule and progress. Financial information would include expenditures and projected costs by year. In addition, periodic meetings (at least annually or more frequently if needed) between staff and the LDCs would be held to review expenditures and strategic priorities. NYGAS has also proposed that the entire process be revisited in two years to ensure that the program is meeting expectations and to determine if any revisions are necessary.

DISCUSSION

Staff supports NYGAS' proposal for a funding mechanism for continued research efforts that would be lost with the phasing out of the GRI surcharge. Staff concurs that the benefits derived from this work should be of significant value to the consumer as well as to the LDCs. Staff would, however, recommend two modifications to the NYGAS proposal: (1) increase the cofunding level to 80%, and (2) eliminate two categories of proposed research program areas.

Staff's rationale regarding setting the cofunding level at 80% is that pooled resources will assure more efficient use of the money. Most of the R&D projects conducted are already cofunded; either by several utilities or in conjunction with equipment manufacturers. Projects with several backers will mean that the dollars will be directed to places where there is more interest and need. It will also give the backers the ability to leverage funds. The remaining 20% of funds collected should give an individual LDC adequate flexibility to do company specific work as needed. If the need should arise by an LDC to direct more than 20% of its annual surcharge collection to an individually funded project it would have the opportunity to petition the Commission for permission to dedicate that level of funding to that project.

With regard to the proposed research program areas staff believes that two areas; natural gas appliances, and gas supply related storage, should not be funded through the NYGAS proposed surcharge. These areas are not part of the distribution function and thus the research should not be funded by distribution ratepayers. Rather R&D in those areas should be conducted by those segments of the industry that have a greater stake in them. Appliances are not restricted to a geographical area. Their uses are national in scope and should be funded by the appliance industry. Similar arguments apply to supply/storage projects. That work should be done by national organizations, those segments of the industry that are supply or storage related. The LDC money, in staff's opinion, would be better directed to distribution research which would have a direct effect on the cost of doing business in New York State.

NYGAS argues that R&D in those areas would benefit the LDCs' customers and would increase business, which in turn, would have the effect of lowering bills. NYGAS has expressed concern that if the distribution companies do not fund this research it may not get done. For example, it argues that in the past the appliance manufacturers have not focused on research developing new gas-fired appliances. The provision of appliances is a competitive market and there are a number of large and small appliance manufacturers serving the market. Staff is of the opinion that competitive market forces in the evolving gas industry will encourage manufacturers to conduct research into new and improved appliances.

If there were to be some unique situation where the LDC could make a compelling argument that a particular project should appropriately be funded by distribution company ratepayers, then the LDC may request an exemption for that specific project.

However, in such an instance, there would be a heavy burden on the LDC for justification.

RECOMMENDATION

It is recommended that the New York Gas Group's petition to establish a voluntary state funding mechanism to support medium and long term gas R&D programs be approved with the following modifications:

1) The required level for co-funding be set at 80% of the surcharge money collected by each LDC, and
2) Money collected via the surcharge mechanism should not be directed to fund natural gas appliance research or to supply/storage projects.
3) An LDC can petition the Commission for waiver of either of these conditions, if it believes that specific circumstances warrant.

Respectfully submitted,

RONALD O. WAGER
Associate System Planner

Reviewed by

PETER CATALANO
Office of General Counsel

Reviewed by:

SHEILA A. RAPPAZZO
Chief, Policy
Office of Gas and Water

Approved by:

Phillip S. Teumim
Director
Office of Gas and Water

APPENDIX A

Vital Research and Development Program Areas

Pipe Installation

1. Economical and widely applicable trenchless technologies

2. Low-cost and automated methods of service and main installation

3. New piping materials compatible with system upgrades and resistant to third party damage

4. Improved excavation and reinstatement materials
   - recyclable
   - minimize disruption

Repair & Maintenance

1. Improved leak pinpointing and pipe locating

2. Positive location of underground facilities

3. Robotic inspection and repair methods

Supply

1. Economical options for natural gas storage in the Northeast

Systems Analysis

1. Advanced models for decisionmaking
   - pressure and capacity optimization
   - use of existing and abandoned infrastructure

End-Use Applications

1. NG-fired appliances and prime movers capable of short term paybacks

Environmental

1. Proactive approaches to environmental issues that impact gas distribution practices

October 4, 1999

Hon. Debra Renner
Acting Secretary
NYS Public Service Commission
Three Empire Plaza
Albany, NY 12223

RE: Case No. 99-G-1369
Petition of New York Gas Group Requesting Approval for New Voluntary Funding Mechanism for GRI Funds for Research and Development

Dear Ms. Renner:

Introduction

By this petition, the New York Gas Group (NYGAS), on behalf of its members, is requesting permission from the Public Service Commission (PSC) to establish a voluntary state funding mechanism to support medium and long term Research and Development (R&D) programs. This funding mechanism will replace the Federal Energy Regulatory Commission (FERC) surcharge used for R & D conducted by the Gas Research Institute (GRI).

The reason for this request is to provide funding for the continued support of medium and long-term R&D programs that will benefit New York's gas ratepayers. FERC has approved a five-year phase-out of the surcharge that has traditionally supported longer-range programs benefiting gas operations and product commercialization. Although the federal surcharge is being phased out, the underlying value of R&D programs remains significant for natural gas customers. NYGAS members therefore are seeking approval for a state mechanism, described below, which will allow them to support new R&D initiatives which meet defined objectives. New York State (NYS) gas customers will derive benefits from this PSC-approved funding as it will serve to replace current customer funding for R&D programs collected through the FERC-approved GRI surcharge.

A. Justification for Proposal

New York's gas ratepayers will benefit by continued funding of medium and long term R&D based on prior documented benefits for R&D programs funded through individual NYS LDCs, NYGAS, and GRI. Benefits to costs analyses performed for GRI, NYGAS and member LDCs show at least $3 of benefits for every $1 invested in R&D. NYGAS proposes that the voluntary funding mechanism used to benefit NYS gas ratepayers should focus on issues that will: (1) enhance safety and reliability of the gas transmission and distribution network; (2) lower the real cost to deliver and distribute natural gas; (3) protect the environment; and (4) increase customer satisfaction and choice to stimulate growth necessary to keep rates down. Appendix A to this petition sets forth the various natural gas R&D programs being proposed for funding through the PSC-approved surcharge. In addition, support for medium and longer term research programs will ultimately benefit shorter term development and demonstration projects that will continue to be funded separately under internal LDC gas research budgets. It is significant to note that over the past five years, both a majority of the LDCs' internally-funded R&D programs and the overall level of GRI funding have been reduced; approval of this petition will provide a mechanism to maintain the already reduced and cost effective intermediate and long term R&D funding at its current level.

B. Funding Issues

A significant portion of gas R&D programs have been funded by gas consumers through a FERC surcharge attached to interstate pipeline transmission rates. This surcharge is approved by FERC annually. It is collected by pipeline companies and forwarded to GRI. As a result of the 1998 agreement among all sectors of the natural gas industry, according to the current plan, this surcharge will be gradually reduced and eliminated altogether in 2004. Attached in Appendix B is a table showing the decrement in the FERC surcharge for the Years 1999 through 2004.

The amount of money to be collected under NYGAS's proposed funding mechanism is designed to mirror the current declining FERC surcharge. NYGAS proposes that the individual LDCs be given the choice or discretion on whether to impose the R&D surcharge on firm sales and transportation customers. LDCs should also be given the choice on the amount of the surcharge – but not to exceed the current FERC-approved maximum amount of $0.0174/dekatherm. In other words, referring to Appendix B, since the FERC surcharge in 1999 declines by .23 cents/dekatherm that would be the maximum surcharge that the LDCs could impose on their gas customers in 1999. In 2004, LDCs could impose a surcharge up to the full maximum amount, $.0174/dekatherm, since the FERC GRI surcharge is projected to be fully eliminated in that year. The total amount of funding through this R & D surcharge would not exceed the amount that each individual LDC paid for GRI in calendar year 1998. As the amount of FERC-approved funding decreases, the amount of the New York surcharge would increase until it reaches a cap that is set at the level of each individual company's 1998 FERC-approved funding. Thus, there will be no increased cost to gas ratepayers for medium and long term R&D.

In this petition, NYGAS proposes that collection of the FERC surcharge continue through a PSC-approved mechanism. Upon approval of this petition by the Commission, LDCs could file new rate leaves that would include an R&D surcharge that, as described above, will not exceed in total the current FERC-approved maximum amount. Subject to Commission approval, the R&D surcharge would be applied to the LDC's rates. LDCs will use deferral accounting to insure that the funds collected from a PSC-approved surcharge and not spent on R&D programs are refunded to gas consumers.

C. Process Issues

NYGAS proposes that LDCs electing to participate in this program will collect the surcharge and insure that the funds are being used to address gas R&D which supports customer needs. It would be each LDC's responsibility to plan, implement, and properly manage appropriate R&D projects. Given the need to provide separate tracking and reporting of surcharge-funded R&D programs from that for LDCs existing internal R&D projects, each LDC's program would need to meet basic criteria. NYGAS proposes that the programs be limited to R&D projects that require twenty-four (24) months or more to generate a commercially deployable product. This definition should also include support for GRI's mutual fund program and other similar research where there is a portfolio of products offered that meet the overall objectives defined under the funding mechanism.

While each LDC is best positioned to measure and respond to the needs of its own gas customers, through NYGAS they have recently generated a list of themes that represent future R&D needs warranting medium and long term research. These needs include: (1) breakthrough technologies capable of providing a quantum leap in gas operation practices, (2) more economical means for insuring gas reliability, (3) proactive programs to meet growing environmental needs, (4) advanced models for decision-making, and (5) improved customer choice. See Appendix A for a specific list of long term R&D needs and programs.

In order to address common needs and avoid duplication, the individual LDCs will collaborate, much in the same way that they do currently, through GRI, NYGAS, and other research consortia. NYGAS proposes that, in order to insure a suitable level of collaboration and maximize the benefits to NYS ratepayers, at least 30% of total dollars collected through this surcharge mechanism be used in projects having two or more co-funders. Such co-funding will reduce the risks posed by long-term R&D projects. 60 78

D. Program Administration

NYGAS proposes that funds collected under this proposed surcharge would be maintained totally separate from existing internal gas R&D funds. Each LDC will be responsible to generate a separate account for this program to insure that uses of funds are not co-mingled with other R&D efforts. To simplify this approach and to aid in PSC oversight of these funds, it is proposed that a web-site be created for technical and financial reporting on funds collected and used through this mechanism. This web-site would allow one means of reporting by each LDC and, through use of a password, PSC Staff could then access summary information describing the objective, expected benefits and status of each project. Costs for administrative tasks by each LDC will parallel existing administrative costs and will only be those necessary to effectively manage the surcharge-funded programs. It is anticipated that these costs would not exceed 10% of the funds collected by each LDC and would be paid out of those funds.

NYGAS proposes that PSC oversight can be insured through the web-site and through a periodic in-person meeting of R&D directors and PSC Staff. This one web-site will be a collective effort to give the PSC convenient access to all projects funded under the surcharge mechanism and one source for technical and financial information. Technical information for each project would include a statement of objectives, milestones, deliverables, schedule, and progress. Financial information would include expenditures and projected costs by year. During the periodic meetings, program overviews, expenditure summaries and a discussion of strategic priorities would be provided by each LDC.

E. Conclusion

Medium and long term R&D can benefit NYS gas ratepayers when their needs are carefully identified and addressed by utility professionals who understand the gas transmission and distribution infrastructure and business. New York's gas LDCs have a history of promoting advancement of technology to the benefit of their ratepayers. The approval of this petition will enhance safety, reliability, and environment and provide a means for continued growth that is needed to keep rates down. By transferring the declining GRI surcharge to a NYS funding mechanism for medium and long term R&D, there is an opportunity to preserve customers' benefits without additional customer costs. Thus, NYGAS seeks approval for maintaining FERC's currently collected gas R&D funds through a voluntary state funding mechanism that will be administered and managed by individual LDCs, used collaboratively, and subject to oversight by the PSC.

If approved, these funds will be treated separately from other sources of R&D funding and will be used to support medium and long term programs.

Sincerely,

Donald F. Straetz

Donald F. Straetz
Executive Director
New York Gas Group

Appendix A

Vital Research and Development Program Areas

- Economical and widely applicable trenchless technologies
- Improved leak pinpointing and pipe locating
- Low-cost and automated methods of service and main installation
- New piping materials compatible with system upgrades and resistant to 3rd party damage
- NG-fired appliances and prime movers capable of short term paybacks
- Advanced models for decisionmaking
  - pressure & capacity optimization
  - use of existing and abandoned infrastructure
- Improved excavation & reinstatement materials
- recyclable
- minimize disruption
- Positive location of underground facilities
- Robotic inspection and repair methods
- Proactive approaches to environmental issues that impact gas distribution practices
- Economical options for natural gas storage in the Northeast

Appendix B

Year	1999	2000	2001	2002	2003	2004
Decrement in Surcharge (cents/dekatherm)	0.23	0.36	0.74	1.04	1.18	1.74

NO. COA00-8

NORTH CAROLINA COURT OF APPEALS

Filed: 6 February 2001

STATE OF NORTH CAROLINA EX REL.
UTILITIES COMMISSION; GAS RESEARCH
INSTITUTE (Movant); PUBLIC SERVICE
COMPANY OF NORTH CAROLINA, INC.
(Intervenor); PIEDMONT NATURAL GAS
COMPANY (Intervenor); NORTH CAROLINA
NATURAL GAS CORPORATION (Intervenor);
NUI NORTH CAROLINA GAS (Intervenor);
FRONTIER ENERGY LLC (Intervenor);
PUBLIC STAFF-NORTH CAROLINA
UTILITIES COMMISSION (Intervenor); and
MICHAEL F. EASLEY, ATTORNEY GENERAL
(Intervenor),
Appellees

v.

North Carolina
Utilities Commission
No. G-100, Sub 76

CAROLINA UTILITY CUSTOMERS
ASSOCIATION, INC. (Intervenor),
Appellant

Appeal by Intervenor Carolina Utility Customers Association, Inc. from order entered 17 August 1999 by the North Carolina Utilities Commission. Heard in the Court of Appeals 8 January 2001.

Chief Counsel Antoinette R. Wike, by Staff Attorney Vickie L. Moir, for intervenor-appellee Public Staff.

Attorney General Michael F. Easley, by Assistant Attorney General Margaret F. Force, for intervenor-appellee Office of Attorney General.

West Law Offices, P.C., by James P. West, for intervenor-appellant Carolina Utility Customers Association, Inc.

SMITH, Judge.

Movant Gas Research Institute (GRI) is a non-profit organization that manages cooperative research and development programs in the natural gas industry. Prior to 1999, GRI was funded primarily by surcharges collected by interstate pipelines from natural gas local distribution companies (LDCs) pursuant to tariffs approved by the Federal Energy Regulatory Commission (FERC). The surcharges were, in turn, passed through to retail customers as part of the LDC's gas costs, pursuant to N.C. Gen. Stat. § 62-133.4 (1999).

In 1998, the FERC approved an agreement, which gradually reduced the level of GRI funding collected through surcharges and called for a complete elimination of funding through surcharges by 31 December 2004. In an effort to maintain its funding at the 1998 level, GRI proposed that LDCs around the country voluntarily contribute the difference between the 1998 equivalent funding level and the reduced surcharge level. In return for these voluntary contributions, the LDCs could designate the types of research they would support.

On 6 January 1999, GRI filed a motion with the North Carolina Utilities Commission (the Commission) "request[ing] the entry of an order authorizing LDCs in the state to make voluntary contributions to GRI for research and to recover such contributions in their annual Rate Adjustments pursuant to G.S. 62-133.4." GRI's proposal was presented to the Commission at its Regular Staff Conference on 25 January 1999. At the Conference, the Public Staff indicated that the proposal raised several important legal and policy issues, including "whether *voluntary* contributions to research (as opposed to mandatory contributions through interstate pipeline tariffs) are Gas Costs as provided in G.S. 62-133.4 and whether dollar for dollar rate recovery (as opposed to recovery as an O&M expense in basic rates) is warranted." Because of these concerns, "[t]he Public Staff recommended that the Commission issue an order requesting comments on GRI's proposal from interested parties and requesting GRI to describe in further detail how other state commissions have addressed the GRI funding issue." Accordingly, on 27 January 1999, the Commission issued an order requesting comments from any interested party and requesting GRI to detail how other states have broached the funding issue.

GRI responded as requested and proposed allowing LDCs to recover their voluntary contributions in their annual gas cost adjustment proceeding rather than as an O&M expense. Filing comments were intervenor-appellant Carolina Utility Customers Association, Inc. (CUCA); intervenor-LDCs Public Service Company of North Carolina, Inc. (PSNC), Piedmont Natural Gas Company (Piedmont), North Carolina Natural Gas Corporation (NCNG), NUI North Carolina Gas (NUI), and Frontier Energy LLC (Frontier); the Public Staff of the Commission; and the Office of Attorney General. In addition to the proposal suggested by GRI, other proposals submitted to the Commission were:

1. Adopting a surcharge mechanism to enable the LDCs to recover voluntary GRI contributions.

2. Denying GRI's motion and making no provision for LDC recovery of voluntary GRI contributions.

3. Approving a transitional accounting mechanism that would allow each LDC to record its voluntary GRI contributions in a deferred account until its next general rate case, at which time the Commission would examine the prudence and reasonableness of the contributions and take these contributions into account when calculating rates for consumers.

After considering the comments and reply comments of all interested parties, the Commission, on 17 August 1999, issued an order wherein it concluded in pertinent part:

> GRI is not a supplier of gas, and voluntary contributions to GRI are not costs "related to the purchase and transportation of natural gas to the [LDC's] system." Therefore, such contributions do not come within the scope of gas cost adjustment proceedings now, and G.S. 62-133.4(e) cannot be used to expand the definition of gas costs to cover such contributions. The Commission concludes that voluntary contributions made by the LDCs to GRI cannot be considered gas costs recoverable under G.S. 62-133.4.
>
> . . . .
>
> The Commission agrees that it has the authority to change rates in a rulemaking proceeding in certain limited circumstances. The question is whether such an approach is appropriate here. The Commission is not persuaded that it is appropriate to establish a surcharge or flow-through mechanism for GRI contributions in a rulemaking proceeding. . . . Given that customer mixes are not uniform and that different LDCs are on record as wanting to invest their GRI research dollars in different ways, the Commission cannot conclude that a generic solution is appropriate herein. Moreover, . . . all cost and revenue changes should be considered together in the context of a general rate case . . . . The Commission concludes that it must

exercise its authority to change rates in a rulemaking proceeding only in limited circumstances and that such an approach is not appropriate here.

CUCA, the Attorney General and the Public Staff all state that any voluntary GRI contributions should properly be classified as O&M expenses and recovered through general rate case proceedings. However, given the unique circumstances of the situation, the Public Staff proposes that the Commission approve a special accounting treatment as a transitional recovery mechanism to bridge the change from FERC-approved gas costs to normal O&M expenses. The Public Staff proposes to allow each LDC to record voluntary contributions made to GRI through December 31, 2004 or the next rate case, whichever is earlier, in a deferred charges account. At the time of each LDC's next rate case, GRI costs would be recoverable to the extent they are found to be reasonable and prudently incurred. The balance in the deferred charges account would be amortized. As a condition of recovery, each LDC should be required to maintain adequate documentation that supports the prudence of its overall contributions. The documentation should include specifics regarding benefits received as the result of participating in GRI research. The Public Staff contends that, with deferred accounting treatment, the LDCs would be allowed "a reasonable opportunity to collect amounts paid to GRI."

. . . .

The Commission's interpretation of the Public Staff's proposal is as follows: As FERC-approved surcharges decrease, we assume that each LDC will make some level of voluntary contributions to GRI. The LDC will be allowed to record the voluntary contributions made until December 31, 2004 or until the time of the LDC's next rate case in a deferred charges account; such deferrals will end on December 31, 2004 or at the time of the LDC's next rate case, whichever is earlier. In the LDC's next rate case, whenever it occurs, a reasonable ongoing level of GRI funding -- whether through FERC-approved surcharges being recovered as gas costs or voluntary contributions of the LDC -- will be treated as O&M expenses in the rate case and reflected in rates. The deferred charges account balance, if found reasonable and prudent, will be amortized in this rate case. The Commission recognizes that if these procedures require that FERC-approved surcharges collected under the interstate pipelines' tariffs be reclassified as O&M expenses in the rate case, an appropriate adjustment would have to be made in the LDC's gas cost accounts to prevent the double-collection of the surcharges in the gas cost adjustment proceedings. The Commission also recognizes that it has no authority to rule that a surcharge approved by the FERC is unreasonable or imprudently incurred and, therefore, surcharges collected through FERC-approved tariffs but reclassified from gas costs to O&M expenses in the rate case would not be subject to Commission prudency review. The Commission believes that these procedures will allow recovery of an LDC's reasonable and prudent funding of GRI and will protect the LDC from a shortfall in recovery during the transition as FERC-approved surcharges decrease and voluntary contributions increase. Furthermore, allowance of carrying charges on the amount in the deferred charges account will make the LDC whole for the delay in recovery. The Commission concludes that the ratemaking procedures described above should be followed in each LDC's next general rate case in order to effect the transition from FERC-approved funding of GRI to funding by voluntary contributions of the LDCs.

. . . .

After carefully considering all of the filings in this docket, the Commission concludes that the Public Staff's proposal as described above is reasonable and should be adopted. The Commission further concludes that the facts and arguments in this docket do not warrant either treatment of voluntary contributions to GRI through gas cost adjustment proceedings or the establishment of a surcharge for GRI funding through a rulemaking proceeding.

(Alteration in original.)

On 15 September 1999, Piedmont filed a motion for reconsideration and/or clarification, contending that the August order "place[d] significant risks on the LDCs" in that "the Commission could upon a hindsight review determine that some or all of GRI's expenditures are imprudent and that the contributions by the LDCs should not be recovered." Accordingly, Piedmont

> request[ed] the Commission to reconsider its August 17, 1999 Order and to approve a continuation of GRI contributions at the current levels pending each LDC's next general rate case, with all such contribution to be deferred in the manner set forth in the Commission's order but without the risk of disallowance upon an after-the-fact review.

Also on 15 September, CUCA filed a notice of appeal and exceptions from the August order.

On 6 October 1999, NCNG filed a motion for reconsideration and/or clarification stating in pertinent part:

> NCNG does not object to a procedure in which the Commission approves a level of GRI contributions for each LDC in a general rate case, although NCNG believes that the preferable way to fund GRI contributions is through a surcharge. Also, NCNG does not object to a procedure in which the Commission reserves the right to require NCNG to discontinue future contributions to GRI if the Commission determines that future contributions would not be prudent. In neither case, however, should NCNG be subject to the risk of retroactive disallowance of its contributions based on hindsight review of the utilization of the contributions to GRI.

Accordingly, NCNG

> request[ed] that the Commission reconsider its August 17, 1999 Order and approve a continuation of GRI contributions at the

> current levels pending each LDC's next general rate case, with all such contributions to be deferred in the manner set forth in the Commission's Order but without the risk of subsequent disallowance.

On 7 October 1999, PSNC filed a statement in support of Piedmont's motion, stating that "PSNC should not be asked to incur the risk that some portion of its voluntary contributions to GRI will be disallowed in a subsequent general rate case. If PSNC is subject to a potential disallowance in a subsequent general rate case, PSNC probably will not make any voluntary contributions to GRI."

On 14 October 1999, the Commission issued an Order on Motions for Reconsideration and on Exceptions. In this subsequent order, the Commission concluded in pertinent part:

> G.S. 62-90(c) provides that when a party files notice of appeal and exceptions as to a Commission order, the Commission <u>may</u> set the exceptions upon which the appeal is based for further hearing. Further, G.S. 62-80 provides that the Commission <u>may</u> reconsider any prior order. While these statutes provide some basis upon which the Commission could consider either the motions for reconsideration or the exceptions filed herein, the Commission concludes that (except as noted hereinafter) the Commission will take no action on CUCA's exceptions and that the Commission will not reconsider the August 17 Order.
>
> . . . .
>
> As to the exceptions filed by CUCA, one exception notes that the August 17 Order uses the phrase "there is much evidence that . . ." and correctly points out that the Commission did not hold an evidentiary hearing. It is clear from the complete sentence being quoted, in context, that the phrase was inadvertent and should have instead read "there were written comments that . . ."

> [sic] The Commission will take no action on CUCA's exceptions and its appeal may proceed.

On 5 November 1999, the Public Staff filed a motion for reconsideration stating in pertinent part:

> Throughout this proceeding, the Public Staff has sought to support reasonable and prudent LDC expenditures for gas research in a way that is consistent with the Commission's statutory authority and traditional ratemaking principles. We continue to believe that the deferral mechanism adopted by the Commission is theoretically the most appropriate way of providing support until the LDC's next general rate cases. We recognize, however, that . . . LDCs in general are unwilling to put any material sums at risk for contributions to GRI. Thus, it appears that the deferral mechanism may prove unworkable in practice.
>
> [] After studying the matter further, the Public Staff believes there is merit to the suggestion of some of the LDCs that the Commission establish a procedure for prior approval of their voluntary contributions to GRI, so that they do not face the possibility of hindsight review and disallowance of deferrals in their next general rate cases. The burden of justifying these expenditures would remain with the LDCs, but they would have the benefit of certainty as to the ultimate ratemaking treatment of approved amounts. . . .
>
> Therefore, the Public Staff requests the Commission to reconsider its prior Orders in this matter and seek further comments on whether a prior approval procedure would satisfy the LDCs' concerns about using the deferral mechanism for voluntary contributions to GRI and, if so, how such a procedure should be implemented. If the LDCs are unwilling to use the deferral mechanism even with the assurance of prior approval, then the Public Staff requests the Commission to consider rescinding its August 17, 1999, Order.

Following responses by CUCA and NCNG to Public Staff's motion, the Commission again issued an order, on 20 December 1999, stating that while the Commission "continue[d] to believe that the August 17 Order [was] well-reasoned and fair and should stand as issued[,]" it would "respond to certain concerns expressed by the LDCs by way of clarification, not reconsideration." The Commission stated that "[n]othing in [its] August 17 Order, including the provisions for documentation of overall GRI contributions, should be interpreted as allowing for hindsight analysis of the prudence of GRI contributions." Rather, the Commission will use a reasonableness standard to determine the prudence of GRI contributions. The Commission stated further, "The Commission-approved procedures are based on the ratemaking principles established by the General Statutes. The General Statutes do not provide for 'pre-approval' of rate case expenses and the LDCs make expenditures every day without the Commission's 'pre-approval.'" Accordingly, the Commission refused to reconsider or rescind its prior 17 August 1999 order.

On 3 January 2000, CUCA filed the record on appeal with this Court and thereafter filed its brief as appellant in this appeal. We are compelled to note CUCA's apparent attempt to circumvent the page limitations set forth in our Rules of Appellate Procedure. *See* N.C. R. App. P. 28(j) (setting 35-page limitations on principal briefs and 15-page limitations on reply briefs). While the text itself extends only to thirty-four pages, CUCA's abundant use of footnotes, the text of which contains much of the analysis necessary to sustain its arguments and consists of extraordinarily small type and single-spaced lines, demonstrates its noncompliance with our rules. If the text of the footnotes complied with the mandates of our rules and was added to the length of the brief, CUCA's appellate brief would have substantially exceeded the thirty-five page limit. *See, e.g., In re MacIntyre*, 181 B.R. 420, 421 (B.A.P. 9th Cir. 1995) ("Had [appellant] used the correct type size for the footnotes . . . , he would have undoubtedly exceeded the thirty page limit by several pages. It is also worth noting that [appellant's] use of footnotes is excessive and attempts to squeeze additional argument into his brief by utilizing the single spacing found in footnotes."); *In re Estate of Marks*, 595 N.E.2d 717, 721 (Ill. App. Ct. 1992) ("[T]he 'footnote' approach to getting around the page limitations is a violation of the spirit, and probably of the letter, of the law and is not favored . . . ."). Similarly, CUCA's reply brief, which spans better than fourteen pages, is strewn with approximately fifty lines of reduced-type text, thus adding additional pages to its brief. This is unacceptable and subjects CUCA's appeal to dismissal. *See Howell v. Morton*, 131 N.C. App. 626, 629, 508 S.E.2d 804, 806 (1998). Nevertheless, we elect pursuant to N.C. R. App. P. 2 to consider this appeal. However, we caution counsel that footnotes are not to be used as a means to avoid the page limitations specified in the appellate rules. *See* N.C. R. App. P. 28(j).

While CUCA raises several issues for our consideration on appeal, we need not reach those issues because we hold that CUCA is not a party aggrieved by the order currently before us and, thus, has no standing to appeal from this order. To appeal from an order of the Commission, "the *party aggrieved* by such decision or order shall file with the Commission notice of appeal and exceptions" within thirty days after entry. N.C. Gen. Stat. § 62-90 (1999) (emphasis added).

We find guidance in this Court's decision in *State ex rel. Utilities Comm. v. Carolina Utility Cust. Assn.*, 104 N.C. App. 216, 408 S.E.2d 876 (1991). In that case, the Utilities Commission had amended a ratemaking formula previously considered and approved by the Commission in a general rate case. The amendment allowed Piedmont to reduce its rates *provided* that it could "remove the cost reduction if and when its gas costs later increased." *Id.* at 217, 408 S.E.2d at 876. CUCA contended it was an aggrieved party "because the order would allow Piedmont to increase its rates in the future to the extent necessary to offset previous reductions under this order." *Id.* at 218, 408 S.E.2d at 877. We disagreed, stating that "[w]hile under this order Piedmont may file, and in fact has filed to make subsequent increases, those proposed increases are not before us." *Id.* at 218, 408 S.E.2d 877-78.

Similarly, in the case *sub judice*, the Commission has authorized no change (increase or decrease) in rates. In fact, it specifically held that, while it "agree[d] that it ha[d] [the] authority to change rates in a rulemaking proceeding in certain limited circumstances[,] . . . [it] [was] not persuaded that it [was] appropriate to establish a surcharge or flow-through mechanism for GRI contributions in a rulemaking proceeding." The Commission specifically accepted the Attorney General's argument "that all cost and revenue changes should be considered together in the context of a general rate case" and concluded that the "exercise [of] its authority to change rates in a rulemaking proceeding . . . [was] not appropriate."

All the August 1999 order purports to do is establish a mechanism by which rates *may be* increased in the future. This speculative recoupment by the LDCs was recognized, as is unequivocally stated in a post-order statement made by PSNC: "If PSNC is subject to a potential disallowance in a subsequent general rate case, PSNC probably will not make any voluntary contributions to GRI." If an LDC opts not to voluntarily contribute to GRI, this transitional funding mechanism will be of no consequence and the issues now presented by CUCA will not arise. Accordingly, because the Commission's order did not impact rates and because any rate increases will be effectuated at subsequent rate cases, CUCA is not an "aggrieved party" and, thus, lacks standing to appeal.

Appeal dismissed.

Chief Judge EAGLES and Judge HUDSON concur.

A TRUE COPY
CLERK OF THE COURT OF APPEALS
OF NORTH CAROLINA

BY [signature]
DEPUTY CLERK

2-6, 2001

North Carolina Utilities Commission

Docket No. G-9, Sub 428

FILED
AUG 23 2000
Clerk's Office
N.C. Utilities Commission

In the Matter of	)	
	)	
Application of Piedmont Natural Gas Company, Inc., for a General Increase in its Rates and Charges	)))	**STIPULATION**

Pursuant to Section 62-69 of the General Statutes of North Carolina ("G.S.") and Rule R1-24(c) of the Rules and Regulations of the North Carolina Utilities Commission ("Commission"), Piedmont Natural Gas Company, Inc. ("Piedmont" or the "Company"), the Public Staff -- North Carolina Utilities Commission ("Public Staff") and Carolina Utility Customers Association, Inc. ("CUCA") (Piedmont, the Public Staff and CUCA are hereinafter collectively referred to as the "Stipulating Parties") submit the following stipulation for the Commission's consideration. The Stipulating Parties stipulate and agree as follows:

1. Background of Stipulation. The events leading to the execution of this Stipulation are as follows:

a. On March 31, 2000, Piedmont filed an application in the above-captioned docket seeking a general increase in its rates and charges, approval of certain changes in its rate schedules, classifications and practices, and approval of certain negotiated contracts.

b. On May 3, 2000, the Commission issued its "Order Setting Investigation and Hearing, Suspending Proposed Rates, Establishing Intervention and Testimony Due Dates and Discovery Guidelines, and Requiring Public Notice."

c. On March 21, 2000, the CUCA filed a petition to intervene, and on March 28, 2000, the Commission granted that petition.

d. In its application, Piedmont proposed a number of new services and cost allocation/rate design changes for its large commercial and industrial customers. These changes include:

i. Revenue changes ranging from a 3% increase to a 27% reduction;

ii. A departure from the "full margin" approach to allocating fixed pipeline demand costs;

iii. A requirement that large commercial and industrial customers make an annual election as to whether they wish to be a sales customer or a stand-alone transportation customer;

change does not seek to allocate fixed gas costs in a manner inconsistent with the provisions of Paragraph 12 of this Stipulation.

15. Service Regulations. The Service Regulations attached hereto as **Exhibit G** should be approved.

16. Special Contract Customers. The two special contracts filed as **Appendix III** to the Company's application in this docket should be approved as filed.

17. Definition of "Full Requirements Customer." The Stipulation Parties agree that the term "full requirements customer" as used in the "Availability" section of Piedmont's tariffs shall mean an entity that does not bypass the Company by having natural gas delivered to it at the same facility or location at which the entity is receiving natural gas delivery services from the Company. The requirement to be a "full requirements customer" does not prevent the entity from purchasing natural gas as a commodity or an alternative energy source from another supplier or from taking natural gas delivery services at another facility at another location.

18. Gas Research Institute. In its Application, the Company requested approval of a funding level for contributions to the Gas Research Institute and of a mechanism for the recovery of such contributions in base rates to the extent that such contributions are not recovered through FERC-approved surcharges included in gas costs. The Company has agreed to withdraw its requests with respect to such contributions without prejudice to its rights to seek recovery of such contributions in another docket, including, but not limited to, the use of the recovery mechanism previously approved by the Commission in Docket No. G-100, Sub 76.

19. Agreement to Support Settlement; Non-Waiver. The Stipulating Parties will support this Stipulation in any proposed order or brief and in any hearing before the Commission in this docket; provided, however, that the settlement of any issue pursuant to this Stipulation shall not be cited as precedent by any of the Stipulating Parties in any other proceeding or docket before this Commission. The provisions of this Stipulation do not necessarily reflect any position asserted by any of the Stipulating Parties. Rather, they reflect a settlement among the Stipulating Parties as to all issues, and no Stipulating Party waives the right to assert any position in any future docket before the Commission.

20. Introduction of Testimony and Waiver of Cross-Examination. The Stipulating Parties agree that all prefiled testimony and exhibits, including the supplemental testimony filed by the Company in support of this Stipulation, may be introduced into evidence without objection, and the parties hereto waive their right to cross-examine all witnesses with respect to all such prefiled testimony and exhibits. If, however, questions should be asked by any person, including a Commissioner, who is not a Stipulating Party, the Stipulating Parties may present testimony and/or exhibits to respond to such questions and may cross-examine any witnesses with respect to such testimony and/or exhibits; provided, however, that such testimony, exhibits and cross-examination shall not be inconsistent with this Stipulation.

Piedmont Natural Gas Company

Post Office Box 33068
Charlotte, North Carolina 28233

R- 773-864-34
T- 703-526-780

CONFIDENTIAL

DATE: 4-19-200

PLEASE DELIVER THE FOLLOWING MATERIAL AS SOON AS POSSIBLE.

TO: ~~Ron Snedic~~ RON EDELSTEIN / TINA THOMAS

FROM: Chuck Fleenor

NUMBER OF PAGES: 14 (INCLUDING COVER PAGE)

Let's discuss after you have had time to review.

PLEASE NOTIFY US IMMEDIATELY AT 364-3120, 1-800-532-0462 (NC), OR 1-800-438-8410 (ALL OTHER STATES) IF NOT RECEIVED PROPERLY.

Before The
North Carolina Utilities Commission
Docket No. G-9, Sub 428

Direct Testimony
Of
Ray B. Killough

On Behalf Of
Piedmont Natural Gas Company, Inc.

Piedmont Natural Gas Company

I. Identification of Witness.

Q. Please state your name and your business address.

A. My name is Ray B. Killough. My business address is 1915 Rexford Road, Charlotte, North Carolina.

Q. By whom and in what capacity are you employed?

A. I am Senior Vice President—Operations of Piedmont Natural Gas Company, Inc. (Piedmont).

Q. Please describe your educational and professional background.

A. I received a B.S. degree in Engineering from N.C. State University in 1970. I was employed by Piedmont in 1973 as the Assistant LNG Plant Supervisor and have since served in the positions of Design Engineer, Manager of Engineering, Director of Engineering, Vice President of Engineering, and in 1993 was promoted to my current position. I am a Registered Professional Engineer in the states of North Carolina, South Carolina and Tennessee.

Q. Have you previously testified before this Commission?

A. Yes. I have previously testified before this Commission on several occasions.

Q. Have you held any positions in natural gas trade associations?

A. As a member of the American Gas Association I have served as Chairman of the Plastic Materials Committee, the Chairman of the Plastic Pipe Symposium, the Chairman of the Regulatory Response Committee, and as Chairman of the Operating Section. I have chaired numerous operations seminars and roundtables in both the Southern Gas Association and the Southeastern Gas Association. I have served on the board of the Southeastern Gas Association and as Chairman of the Operating Group.

II. Purpose of Testimony.

Q. What is the purpose of your testimony in this proceeding?

A. My testimony is being filed to support Piedmont's request that it be permitted to continue to recover its contributions to the Gas Research Institute (GRI) at its current level of funding.

Q. What is the GRI?

A. GRI is a non-profit organization that was established to manage cooperative research and development (R&D) programs in the gas industry. GRI plans and manages R&D efforts but does not engage in R&D activities itself. Laboratories, universities, and various other organizations perform the R&D work under contract with GRI. GRI's activities include planning, procurement (contractor selection and contract award), technical project management, and contract administration.

Q. Has Piedmont made contributions to GRI in the past?

A. Yes. Historically, the GRI was funded through surcharges added to the rates of the interstate pipelines, including the interstate pipelines that transport gas for Piedmont. As shown in the following chronology of events, this funding mechanism was amended through a series of events:

- In March 1997, the Federal Energy Regulatory Commission (FERC) convened a public conference to discuss the future funding of R&D in the natural gas industry.
- In April 1997, the FERC issued a Notice of Proposed Rulemaking (NOPR) to amend its R&D regulations and guarantee long-term funding for GRI. Also in April 1997, the FERC extended the then current method of funding GRI through surcharges.

- In June 1997, GRI filed an application for FERC approval of funding for its 1998 R&D Program and GRI's five-year plan.
- In August 1997, GRI filed a petition for approval of a settlement of the funding mechanism for the five-year plan.
- In November 1997, the FERC approved the 1998 R&D Program and GRI's five-year plan subject to conditions. The FERC referred the settlement to a settlement judge for the purpose of determining the appropriate funding mechanism to be employed by GRI for post-1998 funding.
- During November and December 1997 and January 1998, the parties met on numerous occasions with the settlement judge.
- In January 1998, GRI filed a proposed settlement of the funding issue.
- In March 1998, after considering numerous comments by the parties, the settlement judge certified the settlement to the FERC.
- By order issued on April 29, 1998, the FERC approved the funding mechanism set forth in the settlement.

Q. Please explain the GRI funding mechanism approved by the FERC.

A. The funding mechanism approved by the FERC provides for a transition period during which GRI funding will move from an FERC imposed surcharge to 100% voluntary contributions. The following table shows the mandatory surcharges that will be imposed on Piedmont in connection with its North Carolina operations:

Table 1

Rates (Cents Per Dth)	1998	1999	2000	2001	2002	2003	2004
Commodity	0.88	0.75	0.72	0.70	0.50	.040	0.00
Demand	26.0	23.0	20.0	9.0	6.0	5.0	0

Q. What are the total amounts paid or expected to be collected by Piedmont from its North Carolina Customers under these surcharges?

A. In 1998 and 1999, the North Carolina portions of Piedmont's GRI contributions were $1,531,147 and $1,375,929 respectively. Unless the Commission permits us to recover future voluntary contributions through our rates, the contributions for 2000 through 2004 (based on test period volumes) would be $1,269,367, $790,314, $546,300, $445,538 and $0, respectively.

Q. Does Piedmont believe that it is appropriate for its contributions to GRI to decrease in future years?

A. No. We believe that the R&D administered by GRI provides substantial benefits to our customers and that this R&D should continue to be financed by our customers. In its April 29, 1998 Order, the FERC stated the following:

> "In Opinion No. 418, the Commission stated that it has long held, and continues to hold, the view that GRI's programs benefit natural gas consumers and that there is a need to ensure broad-based and stable funding for consumer-oriented GRI programs. The natural gas technologies developed with GRI funding over the past decade have enabled the natural gas industry to reduce the costs of gas to all classes of consumers. Moreover, new end-use technologies have provided gas customers with improved energy efficiency, lower energy bills, and more productive ways of using energy resources in residential and business applications."

Q. Can you provide specific examples of how the R&D administered by GRI has benefited Piedmont's customers?

A. Yes. Specific examples are set forth in Exhibit _____ (RBK-1).

Q. What does Piedmont believe should be its going-level amount of contributions to GRI?

A. We believe that the amount currently included in our rates is the appropriate going-level contribution.

Q. Please explain your answer?

A. If we were make contributions to GRI at a 100% level, our contributions would be approximately $1,500,000 annually. Although Piedmont believes a 100% contribution level is justified by the results of GRI's R&D efforts, we have decided not to request an increase in our rates. Under our proposal, there would be no change in the rates currently being paid by our customers with respect to GRI.

Q. How do you propose to collect the GRI contributions from your customers?

A. We propose to collect them through a combination of (a) the FERC surcharge on our pipeline transportation rates and (b) our base rates. The following table shows the amount that would be collected under each component of our rates:

Table 2

Year	Pipeline Commodity Surcharge (¢ per Dth)	Pipeline Demand Surcharge [illegible]	[illegible]	[illegible]	[illegible]
2000	0.72	20.0	$1,269,367	0.0	$1,269,367
2001	0.70	9.0	$790,314	$479,053	$1,269,367
2002	0.50	6.0	$546,300	$723,067	$1,269,367
2003	0.40	5.0	$445,538	$823,829	$1,269,367
2004	0.00	0.0	$0	$1,269,367	$1,269,367

As you can see from the table, as the pipeline surcharges decrease, the amount included in our base rates increase by an equal amount. As a result, there is no change in the total amount included in the rates billed to customers.

Q. In your opinion, is your GRI funding request consistent with the Commission's order of August 17, 1999 in Docket No. G-100, Sub 76?

A. Yes. In that order, the Commission stated the following:

> "In the LDC's next rate case, whenever it occurs, a reasonable ongoing level of GRI funding—whether through FERC-approved surcharges being recovered as a gas costs or voluntary contributions of the LDC—will be treated as O&M expenses in the rate case and reflected in rates."

This is the first rate case filed by Piedmont since the Commission's order and, therefore, is the "next rate case" within the meaning of the Commission's order. In this case, we are simply seeking to recover our ongoing level of GRI funding as provided in that order.

Q. Are you aware that the Commission's August 17, 1999 Order is on appeal to the courts?

A. Yes. However, I do not believe the result of that appeal should affect the outcome of our request in this case. This Commission has historically permitted utilities to recover their prudently incurred expenses, including contributions to industry research groups. For example, the Commission has permitted electric utilities to recover their contributions to the Electric Power Research Institute. It should be noted that Piedmont has not deferred any amounts under the August 17, 1999 Order and, therefore, is not relying on that order for the recovery of its GRI contributions. Piedmont is simply seeking in this general rate case to recover its prudently incurred O&M expenses in the same manner as any other prudently incurred O&M expense. As previously stated, we are not seeking any different treatment than the treatment historically given to electric utilities in connection with their contributions to the Electric Power Research Institute.

Q. In your opinion, is the ongoing level of GRI contributions that Piedmont seeks to recover in this case prudent?

A. Yes. I believe the ongoing level of GRI contributions that Piedmont seeks to recover in this case is prudent for the following reasons:

1. For many years, the FERC and its staff have reviewed and approved GRI's budget, its expenditures and the results of those expenditures. The FERC has consistently found that the GRI's programs benefit natural gas consumers and that there is a need to ensure broad-based and stable funding for consumer-oriented GRI programs.
2. Several state commissions have also examined GRI's programs and have concluded that they benefit consumers. For example, the Staff of the New York Public Service Commission has recently recommended that New York's LDC be permitted to recover their voluntary contributions to GRI.
3. As set forth in the exhibit attached to my testimony, Piedmont's customers have directly benefited from a number of the GRI programs.
4. Under the GRI settlement approved by the FERC, the GRI's board of directors will have representatives from GRI, from the natural gas industry and from consumer interest groups. The Process Gas Consumers Group, the American Iron and Steel Institute, and the Fertilizer Institute are each permitted to select one member of GRI's board of directors.
5. The GRI settlement has wide support. In its January 6, 1999 Order approving the GRI settlement, the FERC summarized this support as follows:

> "Understandably, many of GRI's Board members, as well as beneficiaries of GRI largess, have rallied to support the proposed settlement. However, many other segments of the greater "natural gas industry" find merit in the settlement. It is supported by INGAA, representing most interstate gas transmission companies, and 33 interstate pipelines have agreed to the offer of

> settlement. The settlement is also supported by representatives of both large producers and the trade association for 8,000 small producers. It is supported or not opposed by NARUC, a number of environmental/public interest groups, five large industrial organizations, Exxon Corporation, and at least two state entities. Further, the settlement is supported by the American Gas Association, and not opposed by the American Public Gas Association. While the Commission cannot rely merely on head-count, the Commission takes note of the breadth of the support of the settlement across the natural gas industry and the beneficiaries of GRI's program. The settlement judge appears to be correct in observing that the settlement is broadly supported by a cross-section of parties representing all segments of the industry and the public.

6. Beginning in 2001, only "Core Projects" may be included in GRI's budget. "Core Projects" are projects that, among other things, are "likely to benefit residential, commercial and industrial gas consumers as a group." This provision should assure that the ratepayers who indirectly contribute to GRI's R&D programs benefit from those contributions.
7. The GRI settlement provides for oversight of GRI's expenditures. For example, the settlement provides for a "Core Program Executive Committee" to oversee and administer GRI's Core Program. This committee must have nine members, four of whom represent consumer interests. The Core Program Executive Committee must submit an annual report of its recommendations and observations, and this report must be included in GRI's annual report to the FERC.
8. Neither Piedmont, nor any other LDC, can alone afford to employ the expertise and fund the expenditures required for a successful R&D program of the magnitude administered by GRI.

Q. Do you have anything further to add to your testimony?

A. No.

Exhibit ___ (RBK-1)

Examples of R&D Administered by GRI
Beneficial to Piedmont's Customers

1. Plastic Pipe

Recently, Piedmont began using "Medium Density" plastic pipe rather than the "High Density" that had previously been used. GRI plastic pipe research results indicates that "Medium Density" plastic pipe performed as well and was as safe as "High Density" plastic pipe. The GRI research results were one of the primary factors considered in Piedmont's decision to make the change. Piedmont has experienced a benefit valued at approximately $1,600,000 in North Carolina in the past two years.

2. Carbon Monoxide (CO) Detector Standards

As much as Piedmont would like not to be involved with CO alarm response, our customers continually call for assistance. Until recently CO detectors have had a relatively low alarm threshold level. Untold numbers of customer calls were the result of "false alarms" or situations where CO levels were very low. Research by GRI indicates that the threshold level for a CO detector alarm could effectively be doubled and still not represent a health hazard to the inhabitants. New standards have been approved for CO detectors that will result in fewer alarms and, therefore, fewer unnecessary service calls. Piedmont conservatively estimates a 20% reduction in future CO service calls.

3. Manufactured Gas Plant (MGP) Site Cleanup Technologies

GRI has performed extensive studies relating to MGP site cleanups. At this time, it is not feasible to perform a quantitative analysis of the savings generated by this research for Piedmont, but GRI sponsored research has been and continues to be the primary contributor for the reduction of MGP cleanup costs.

4. Pipeline Current Mapper (PCM)

The PCM allows the detection of pipe coating defects and "shorts"- points where underground structures come in contact with steel gas pipelines. The PCM uses new technology which enables metallic contacts and coating defects to be identified in less time and with fewer "dry holes" than was possible with previously used techniques. Piedmont has recently purchased one of these units and expects to enhance safety and save labor costs as a result of reduced time spent locating cathodic protection problems. Estimated annual labor savings are estimated to be in the $21,000 range.

5. Pipeline Crossing Software

Piedmont has in the past been required at railroad/pipeline crossings and, in some instances, road/pipeline crossings to install the crossing piping within a "casing" pipe. As a result of GRI funded research, these requirements are no longer the standard. Piedmont can now calculate the pipe wall thickness that allows the pipeline to be installed as an uncased crossing, which is also a safety enhancement. Savings in the range of $50 per foot of cased pipe are realistic when the entire process is taken into account. It is estimated that Piedmont has about 600 feet /year in railroad and road crossings that in the past have required cased crossings. This equates to a $30,000 annual initial savings. Future maintenance considerations are also eliminated for which a value is difficult to estimate.

6. Guided Boring System and Software

Guided boring is a trenchless technology that is used to install and replace mains and services. Because this technology minimizes restoration activity, Piedmont can save on pipe installation costs. If Piedmont were able to save $3 per foot and if the boring system were used to install 10 miles of pipe per year, an annual savings of approximate $158,000 should be expected.

7. Ultrasonic Joint Detector

Polyethelene plastic gas pipe is joined by heat fusion. Those persons performing the heat fusion process must be qualified. Until GRI developed the ultrasonic joint detector, there was not an easy and practical way to non-destructively detect inferior plastic fusion joints. This unit is used to help better qualify those persons performing the plastic pipe joining process and to test field joints. Although this is primarily a safety enhancement issue, detection of inferior field joints before backfilling has cost saving implications; however, Piedmont is unable to quantify the value of these benefits.

8. Soil Compaction Guidelines

When excavating on highway rights-of-way, Piedmont is required by NCDOT to properly compact the ditch backfill. GRI studies have produced Compaction Guidelines that have greatly benefitted Piedmont and NCDOT. Again these benefits are difficult to quantify.

9. Orifice Meter Standards

GRI has performed research in the area of orifice meter standards specifically relating to measurement calculations. Existing methodologies have been validated.

10. Ultrasonic Gas Measurement

Ongoing research with ultrasonic gas measurement indicates that it is a viable methodology and can soon be implemented in the gas industry. The result will be greatly reduced costs for large volume measurement applications.

11. LNG Regulation Revisions

GRI research in the area of LNG facility siting requirements indicates that certain heat of radiation and vapor dispersion distances can be reduced from current levels. GRI has developed computer models for both calculations that would allow a smaller distance than the present regulations. The Office of Pipeline Safety has accepted the research and is presently in the process of adopting the rule change. The impact of this rule change will greatly reduce the cost of future LNG facilities.

State PUCs

GAS CAPACITY RIGHTS. The New York PSC told retail suppliers that to serve firm retail gas load they must have rights to firm, non-recallable, primary delivery point pipeline capacity for the five winter months, November through March, or else must augment secondary capacity with a standby charge payable to local distribution companies holding primary rights.

Nevertheless, it acknowledged that part-year capacity is difficult to obtain (LDCs feel they get higher prices for releasing a 12-month block) and thus set a safe harbor rule promising that LDCs will get full credit for mitigating stranded capacity costs if they offer up at least a seven-month block of capacity to marketers, with no second-guessing by the PSC on the price. *Case 97-G-1380, Aug 18, 1999 (N.Y.P.S.C.).*

GRI FUNDING. North Carolina denied a proposal by the Gas Research Institute to allow natural gas local distribution companies to recover voluntary contributions to GRI through their annual gas cost adjustment proceedings as a way of supplementing GRI funding to offset the Federal Energy Regulatory Commission's mandatory phase-out (by 2005) of cost recovery for interstate pipelines for GRI contributions.

State regulators cautioned against automatic recovery, saying instead they would allow LDCs to defer voluntary GRI contributions and submit such items as operation and maintenance costs in ordinary rate cases. *Docket No G-100, SUB 76, Aug. 17, 1999 (N.C.U.C.).*

ELECTRIC RELIABILITY. The Illinois commission on Aug 17 launched an investigation into the reliability and management of Commonwealth Edison's overall distribution system in response to the Aug 12 power outage The utility will pay the costs of the probe

RIGHT-OF-WAY SALE PROCEEDS. The Maine PUC ruled that electricity ratepayers of Central Maine Power Co. are entitled to proceeds from the utility's sale of rights of way on its transmission corridors to Portland Natural Gas Transmission System and Maritimes and Northeast Pipeline LLC, two gas pipeline projects planning to bring Canadian natural gas south into New England. The PUC allocated 90 percent of the proceeds to electricity ratepayers, while giving 10 percent to shareholders as an incentive for CMP to negotiate for the highest possible price in similar future transactions

The PUC rejected CMP's argument that ratepayers are like tenants in that they do not bear any risk of loss, saying that CMP ratepayers shouldered significant economic burdens associated with the land. The PUC also noted that the transmission corridors over which the rights of way were granted generally were created through the use of eminent domain *Docket No 99-155, Aug 2, 1999 (Me P.U.C.)*

COMMISSIONER IMPARTIALITY. Commissioner Nancy Brockway of the New Hampshire PUC denied motions by a taxpayer group and the state's consumer advocate seeking her disqualification for allegedly prejudging certain issues regarding stranded costs for Public Service Co of New Hampshire, but she also asked her PUC colleagues to seek review at the state supreme court, since a reversal could void any decisions made in the dockets

Brockway alone ruled on the motion, believing that state law required action by the "subject decisionmaker," subject to a supreme court appeal The motion alleged she had warned a PUC witness that any adverse testimony "could scuttle the deal" before PUC review *DR 96-50 et al., Aug 6, 1999 (N.H.P.U.C.).*

STRANDED COSTS. Using a production cost simulation model, predicting market prices for electricity (energy and capacity) ranging from $32 09 per megawatt-hour in year 2000 to $64 61 per megawatt-hour by 2030, Connecticut regulators allowed United Illuminating Co to recover some $800 million in stranded costs, with $487 million attributable to nuclear assets, $153 million for generation-related regulatory assets, and $160 million for above-market purchased power contracts, after a $16.5 million offset for proceeds from sale of the New Haven Harbor and Bridgeport Harbor fossil plants. *Docket No 99-03-04, Aug 4, 1999 (Conn D.P.U.C.)*

NATURAL GAS SLAMMING. The Georgia PSC on Aug 3 voted to investigate allegations that a natural gas marketer, United Gas Management, had engaged in "slamming"—the unauthorized switching of customers, and set a hearing for October Since deregulation began in November 1998, the PSC had received 200 complaints about United If found guilty, the company could be fined up to $15,000 per violation and have its authority to conduct business in the state revoked

COMMONWEALTH OF PENNSYLVANIA

OFFICE OF CONSUMER ADVOCATE
555 Walnut Street 5th Floor, Forum Place
Harrisburg, Pennsylvania 17101-1923
(717) 783-5048

IRWIN A POPOWSKY
Consumer Advocate

FAX (717) 783-7152
E-Mail: paoca@ptd net

July 9, 2001

James J. McNulty, Secretary
PA Public Utility Commission
Commonwealth Keystone Bldg.
400 North Street
P.O. Box 3265
Harrisburg, PA 17120

Re: Proposed Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies
Docket No. M-00011462

Dear Secretary McNulty:

Enclosed for filing please find an original and fifteen (15) copies of the Comments of the Office of Consumer Advocate in the above-referenced proceeding.

A copy of this document has been served upon all parties of record as shown on the attached Certificate of Service.

Sincerely yours,

Lori A. Pantelich
Assistant Consumer Advocate

Enclosure
cc: All parties of record
64611 wpd

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PROPOSED POLICY STATEMENT REGARDING COLLECTION OF RESEARCH AND DEVELOPMENT FUNDS BY NATURAL GAS DISTRIBUTION COMPANIES	:	Docket No. M-00011462

COMMENTS OF
THE OFFICE OF CONSUMER ADVOCATE

On April 20, 2001, the Public Utility Commission ("the Commission") entered an Order on a Proposed Policy Statement Regarding Collection of Research and Development ("R&D") Funds by Natural Gas Distribution Companies ("NGDCs" or "Companies"). In the Order, the Commission invited interested parties to comment on its proposal to allow NGDC's to implement a surcharge mechanism under 1307(a) to recover R&D expenses of the Gas Technology Institute ("GTI"). The Commission published a notice in the Pennsylvania Bulletin on June 9, 2001, indicating that Comments from interested parties were due thirty (30) days after such notice. The Office of Consumer Advocate ("OCA") appreciates the opportunity to provide comments on this important consumer issue.

I. INTRODUCTION

The Commission's proposed policy statement essentially reverses a Commission Order on the same issue that was unanimously adopted by the Commission one year ago. There is no basis for this change; there is no justification for this Policy Statement and it should be rejected.

In its Order, the Commission notes that natural gas R&D has been funded, in part, through surcharges assessed by interstate natural gas pipeline companies. Traditionally in Pennsylvania, these charges from the interstate pipelines were treated as a cost of natural gas and recovered through purchased gas cost rates. Since 1998, these interstate pipeline surcharges are being phased out over a seven year period pursuant to a settlement approved by FERC.[1] The pipeline surcharges will be eliminated completely in 2005.

The Commission has already considered whether recovery of these R&D costs by an NGDC through an automatic surcharge is appropriate. By Order entered June 8, 2000, the Commission unanimously denied a Petition of the Pennsylvania Gas Association that sought issuance of a policy statement authorizing the funding of these R&D costs through a 1307(a) surcharge mechanism. In denying that Petition, the Commission expressed concerns with the use of a surcharge mechanism for R&D cost recovery and concluded that recovery through base rates, which would allow a full examination of the nature of the proposed research and the potential benefits, was more appropriate

[1] On April 29, 1998, FERC approved a settlement to transition over a seven year period from a system of recovery of R&D expenses through a mandatory, discountable demand and commodity surcharge mechanism to recovery of R&D completely through voluntary contributions of NGDCs, pipelines, and others. Order, Gas Research Institute, Research Development and Demonstration Funding, Docket Nos. RP97-149-003, RP97-149-004, RP97-391-001, and RP97-391-002, 83 FERC ¶ 61,093 (entered Apr. 29, 1998) ("FERC Order").

and fair.

In its April 20, 2001 Order, however, the Commission revisits this issue and proposes to amend 52 Pa Code Chapter 69 by adding Section 69.1301, which will establish a policy statement governing the collection by NGDCs of R&D costs associated with GTI, the new corporate name of the Gas Research Institute and the Institute of Gas Technology. This new section would allow NGDCs to recover, seventy-five (75) percent of R&D expenses from customers through a 1307(a) surcharge mechanism for a six-year period. The shareholders of each NGDC would be responsible for the remaining twenty-five (25) percent of the expenses related to R&D.

The seventy-five (75) percent of R&D expenses charged to customers are to be recovered through 1307(a) charges assessed on the customer class purportedly receiving the majority of the benefit of the R&D projects that are funded throughout the six-year phase-out period. If there is no customer class receiving the majority of the benefit, the surcharge is to be based on a throughput volumetric basis applied to all customer classes. At the end of the six-year phase-out period, NGDCs will no longer be able to recover these costs through a 1307(a) surcharge. Instead, an NGDC may make a request to the Commission to roll these costs into base rates.

The OCA opposes recovery of R&D costs through a Section 1307(a) surcharge mechanism. While the OCA does not dispute the possible benefit to the natural gas consumers from a portion of the R&D undertaken by GTI, such costs are routine business expenses and there is no reason that NGDCs' expenditures for R&D should be treated differently than other items that are recovered in base rates. Nor is there any reason for the recovery of gas R&D expenditures to be treated differently from recovery of comparable expenditures by the electric or any other utility industry.

The OCA notes that no other industry enjoys guaranteed cost recovery through a 1307(a) mechanism for R&D expenditures. The gas industry is no different than any other utility industry that voluntarily contributes to R&D. The NGDCs, like electric utilities, should seek to recover R&D expenditures through the traditional base rate procedures.[2]

II. DISCUSSION

A. <u>The Commission Should Continue To Follow The Policy Set Forth In Its Decision In Pennsylvania Gas Association's Petition For Promulgation Of A Policy Statement Regarding Collection Of Research and Development Funds By Natural Gas Distribution Companies.</u>

The OCA continues to object to a surcharge mechanism for recovery of R&D costs based on concerns similar to those raised in its Answer to the Petition of the Pennsylvania Gas Association[3] ("PGA") wherein the Commission ultimately denied PGA's Petition to recover R&D expenditures through a 1307(a) surcharge mechanism. In its Final Order, the Commission said it shared the concerns of the OCA, stating that a 1307(a) surcharge on customers is "both unfair and inappropriate." <u>Re Pennsylvania Gas Association</u>, Docket No. P-00991738, slip opinion, at 4 (entered June 8, 2000) ("June 8, 2000 Order"). The Commission stated that "funding through base rates will enable [the Commission] to examine the nature of the proposed research and the potential benefits." <u>Id.</u> The Commission reasoned that "blanket support of research by NGDC customers alone is no

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[2]As will be explained in more detail below, a surcharge mechanism for recover of the portion of the R&D costs that would qualify under the proposed Policy Statement, i.e., the non-core costs, is particularly inappropriate.

[3]Promulgation of Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies, Docket No. P-00991738 (Order dated June 8, 2000)

longer appropriate" given the potential deregulation of the gas industry. Id. The Commission denied the recovery of R&D expenditures through a surcharge mechanism.

In reaching this opinion, the Commission was persuaded by the FERC Order, which phased out the surcharge at the federal level. In its Order phasing out surcharge recovery, FERC stated that voluntary contributions to GTI were more appropriate. Id. This Commission stated that its rationale in not allowing recovery of R&D expenses through a 1307(a) surcharge is consistent with FERC's view of R&D funding. Id.[4] The Commission also noted that "forcing non-competitive residential and small commercial customers to pay all [GTI] expenses is inimical to the spirit of FERC Order." Id.

In its current April 20, 2001 Order, however, the Commission is now proposing to allow a surcharge mechanism to recover R&D expenses on the basis that such expenses benefit consumers. In its proposed Policy Statement, the Commission seeks to address its concern regarding a surcharge mechanism raised in its prior Order by proposing a sharing mechanism that requires shareholders to absorb twenty-five (25) percent of the costs and a matching principle which would require those customer classes benefitting from R&D to pay and where no specific benefit is identified,

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[4]FERC stated that in Opinion 418, it endorsed the concept of a transition to an entirely voluntary funding mechanism. Research, Development and Demonstration Funding, Docket Nos. RP97-149-003, RP97-149-004, RP97-391-001 and RP97-391-002 (Order issued Apr. 29, 1998) (referencing Opinion and Order Approving the Gas Research Institute's 1998 R&D Program, 81 FERC ¶ 61,182 (Nov. 12, 1997)). FERC's objective was to develop a long-term funding mechanism to provide GTI with "sufficient stability to continue its R&D with a view toward the future[ ]" Id. As a result, FERC approved a settlement agreement that phases-out a surcharge mechanism and implements voluntary funding for R&D by pipelines. Id. To the extent pipelines voluntarily contribute funding for GTI's budget after 2004, they must seek recovery of those costs through base rate filings. Id.

for all customers to pay a volumetric basis. The OCA submits that the Commission's proposed Policy Statement is premised on an incorrect reading of the FERC Settlement. Moreover, the surcharge mechanism does not adequately address the problems of allowing recovery of these ordinary business expenses outside of the process of a full base rate review.

1. <u>The Commission's Policy Statement Is Based On An Incorrect Premise.</u>

The OCA submits that the premise of the Commission's proposed Policy Statement, that the costs at issue provide a direct benefit to natural gas consumers, may miscomprehend the nature of the costs that would qualify for recovery through the surcharge mechanism contained in the proposed Policy Statement. The Commission notes in Section 69.1301(c) of the proposed Policy Statement that it is considering providing Section 1307(a) treatment for these costs because natural gas research and development is beneficial to natural gas consumers. The R&D costs that would qualify for recovery under the proposed Policy Statement would primarily be those associated with Non-Core Programs, those programs with more limited applicability.

It is important to note that the FERC Settlement in the 1998 GRI proceeding created two categories of projects to be funded under GTI's R&D program: Core Programs and Non-Core Programs. *Gas Research Institute, Research, Development and Demonstration Funding*, Order Approving Settlement, 83 FERC ¶ 61,093 (1998). Core Programs are defined in Appendix C of the FERC Settlement as those programs providing widely dispersed benefits predominantly for natural gas consumers. *Id.* at 61,455, Slip Op at 3. Core Programs include those that: a) enhance health and safety; b) increase gas system reliability or integrity; c) enhance environmental quality; d) lower gas industry operating and maintenance costs; e) increase gas supply from emerging resources; and f) increase efficiency. *See* Appendix C of Stipulation and Agreement in Docket Nos. RP97-149-000 *et al.* certified to FERC on March 10, 1998 by the Settlement Administrative Law Judge and approved at 83 FERC ¶ 61,093 *supra*.

Core Program costs will continue to be recovered through mandatory pipeline surcharges through 2004. Non-Core Programs, on the other hand, are those related to more limited or targeted segments of the industry. *Id.* Thus, natural gas consumers may not benefit from Non-Core Programs. GTI often undertakes Non-Core Programs on a joint venture basis with the entity that benefits most directly from such R & D. After December 31, 2000, only Non-Core Program costs are no longer recovered in pipeline surcharges. *Id.* After December 31, 2004, any pipeline contributions to GTI, either Core or Non-Core, must be recovered through a means other than a mandatory surcharge. Such means include pipeline base rate proceedings where the nature of the costs can be challenged and reviewed. *Id.* at 61,456, Slip Op. at 5

Thus, until 2005, the primary GTI budget costs not being recovered through pipeline surcharges and thus recoverable under the Commission's proposed Policy Statement are those relating to the Non-Core Programs. Such costs by definition are costs whose relationship to natural gas consumers is limited. The Commission should not pre-judge the nature of such costs as beneficial toward consumers by allowing recovery of contributions toward such Non-Core Program costs through a Section 1307(a) proceeding. Each component of the Non-Core Program costs to be funded through NGDC contributions will have to be scrutinized to assure that NGDC customers do in fact receive benefits from these Non-Core Program R& D costs. Analysis of the relationship of these costs to consumer benefits is best undertaken in a base rate proceeding. The fact that these Non-Core Program costs may well be unrelated to benefits received by gas consumers from GTI's work makes any NGDC contribution toward these costs unsuitable for surcharge tracking recovery through a Section 1307(a) mechanism.

The OCA submits that the Commission should continue to follow FERC's lead and not allow NGDCs to do on the state level what FERC is eliminating on the federal level. FERC has taken many steps in recent years to open interstate pipeline rates and services to competitive market forces. Pennsylvania has also taken the lead to open retail markets to competition with the passage of the Natural Gas Choice and Competition Act. The Commission should not now promulgate a Policy Statement approving mandatory surcharges to recover R&D contributions, especially since it has properly denied a previous request for such a mechanism just a year ago.

2. <u>No Extraordinary Reason Exists To Provide Guaranteed Recovery Of Voluntary Contributions To GTI Through A Surcharge</u>.

FERC's decision to phase-out use of a mandatory surcharge for gas R&D cost recovery is consistent with the industry's move toward competition. This Commission's newly proposed Policy Statement returns Pennsylvania consumers to the use of an automatic surcharge mechanism to recover R&D costs–a mechanism that is inappropriate for recovery of ordinary business expenses and inconsistent with the move towards more competitive natural gas markets. This Commission has always viewed surcharges as "a temporary measure to meet *unusual* circumstances and not as a permanent, and continually increasing, element" of rates. <u>Re Fuel Surcharge for Motor</u>

and Rail Common Carriers, 54 Pa. P.U.C. 272, 273 (1980) (emphasis added). Mandatory surcharges should only be employed in unusual and extraordinary situations.[5] In its proposed Policy Statement, the Commission has not identified any unusual or extraordinary reason that natural gas industry R&D costs deserve unique treatment as compared to the R&D costs of any other utility industry. There is nothing so unusual or extraordinary about recovery of gas R&D costs that requires a mandatory surcharge recovery mechanism.

The OCA submits that no other industry enjoys the monopoly protection for funding R&D that the gas industry has enjoyed. For example, the electric industry employs a voluntary program in which the costs of participation by the electric utilities are subject to recovery in the same manner as are other routine operating expenses that are recovered in base rates. Continuing to allow gas companies to fund R&D efforts through a guaranteed cost recovery mechanism provides the gas industry a competitive advantage over other industries which compete in the energy market. The OCA submits that the role and funding of R&D in the electric industry, particularly the R&D conducted by the Electric Power Research Institute ("EPRI"), provides a useful model for the gas industry. Electric utilities contributing to EPRI research have the ability, but not the guarantee, of recovering these costs from consumers in base rate cases. Despite the use of this voluntary funding mechanism, EPRI continues to provide important research and development services to the electric power industry. In this case, there is no evidence that gas R&D programs will diminish absent a surcharge cost recovery

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[5]The Commission has allowed a surcharge for the recovery of non-gas transition expenses stemming from deregulation. See Pennsylvania Pub. Utility Comm'n v. The Peoples Natural Gas Co., Docket No. R-00932915, 1994 WL 712489, at *38 (Pa. P.U.C July 21, 1994).

mechanism. Guaranteed cost recovery for these R&D costs is inappropriate for this competitive energy market. Such a result is inconsistent with FERC's intent in phasing-out recovery of these costs through pipeline surcharges. As FERC noted in its Order, its objective is to "ensure a broad-based voluntary, long-term funding mechanism for GTI." FERC Order at ¶ 61,456.

3. R&D Costs Should Be Treated Like Other Costs Claimed In Base Rates.

To the extent such R&D expenditures provide benefits to the distribution customers of regulated NGDCs, such costs should be recovered like other just and reasonable regulated operating expenses, *i.e,* through base rates. A 1307(a) mandatory surcharge is inappropriate and unreasonable for several reasons. First, as noted above, surcharges are designed to recover unusual costs of business or costs that are very large and fluctuate so much as to put a business at unusual risk if adjustments are not made. There is nothing so extraordinary about NGDCs' investment in R&D as to justify the unusual approach of mandatory surcharge funding. These contributions to GTI are similar to many other utility costs of doing business. Thus, Companies should have the opportunity to recover these costs through base rates just as they have the opportunity to recover any routine business expense through base rates. The Company's decision to fund R&D should be examined in the same way as other business costs. The reasonableness and prudence of the expense should be evaluated in a base rate proceeding.

Second, automatic surcharges provide a disincentive to control costs. Implementation of a mandatory automatic surcharge, even for a limited period of time, without strict prudence reviews would create a disincentive for companies to manage their R&D costs. On the other hand, annual prudence reviews for the purpose of examining research and development costs would impose additional unnecessary regulatory costs on all concerned. The OCA submits that it makes more sense for the Commission to address these costs as part of an overall review in a base rate case. In such a base rate case, the Commission could determine the appropriate normalized level of costs that should be reflected in rates on an ongoing basis. Additionally, the Commission could consider all necessary elements such as prudence, cost allocation to the customer classes, and the appropriate level of sharing costs between ratepayers and shareholders.

The Commission is not required to guarantee cost recovery of any expense but is required instead to provide the utility with a reasonable opportunity to recover its overall just and reasonable costs. This is not a novel theory but is one that has been employed for decades. Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 88 L.Ed. 333, 64 S.Ct. 281 (1944). The Commission's Policy Statement proposing a mandatory surcharge is contrary to fundamental principles of ratemaking.

Additionally, implementation of a mandatory surcharge would constitute single-issue ratemaking. A mandatory surcharge mechanism asks the Commission to consider only one isolated element of expense without also considering offsetting revenues or expense decreases. When rates are changed, all costs and revenues must be open to review and analysis to ensure that all changes are reflected. In this manner, the Company has a reasonable opportunity to recover its overall costs on an ongoing prospective basis.

B. The Commissions Proposal Does Not Substitute Adequately For Base Rate Review.

The Commission has stated that GTI R&D is beneficial to the natural gas industry. The OCA does not generally disagree with this statement. However, since the primary GTI costs that can be recovered by NGDCs under the Commission's proposed Policy Statement are related to Non-Core Program costs in GTI's budget that may benefit more targeted entities, there is no assurance that natural gas consumers benefit from the particular Non-Core Program costs that the NGDCs may seek to fund. Additionally, there is no indication that the sharing and matching principle proposed by the Commission will consider the necessary information to make the necessary determinations regarding these expenses. The OCA is concerned that consumers, particularly residential customers, will have the burden of paying R&D costs without the overall analysis that a base rate case will provide to determine the prudence of such expenditures, whether consumers should be responsible for a majority share of R&D expenses, whether residential consumers are, in fact, receiving proportional benefits from such R&D projects, and whether overall rates must be increased at all to permit recovery of these expenses.

The Commission's Policy Statement proposed a sharing mechanism, which makes shareholders responsible for twenty-five (25) percent of the R&D expense and consumers responsible for seventy-five (75) percent. While the OCA submits that this sharing mechanism may be appropriate after review in a base rate case, the Commission's proposed seventy-five (75)/twenty-five (25) mechanism may overlook important considerations. For example, the proposed sharing mechanism is not based on a review of whether the expenditures are reasonable and prudent, provide appropriate benefits to customers or provide benefits to more targeted entities. Moreover, the sharing mechanism does not consider the benefits to the Company from such research or the level of earnings of the Company. For example, if an NGDC is over-earning its authorized return, an argument can be made that it is already recovering any additional contributions it might make to GTI other than the costs it funds through pipeline surcharges in 1307(f) proceedings for GTI's Core Program costs. Providing for additional recovery through a 1307(a) proceeding without consideration of the overall financial status of the NGDC may simply ensure continued over-earnings at ratepayer expense. The OCA submits that these and other necessary considerations to determining costs responsibility should be reviewed in a base rate case.

In addition to the sharing mechanism, the Commission proposes that NGDCs shall be required to reasonably match the customers' seventy-five (75) percent share of R&D expense with the customer class that receives the majority of the benefit of the package of R&D programs selected by NGDC management. This determination is not an easy one to make. Many sectors of the natural gas industry, *e.g.*, producers, industrial consumers, commercial consumers, manufacturers of natural gas equipment, pipelines, and the NGDCs themselves might each benefit from different R&D projects. Allowing NGDCs to determine which projects to claim recovery for and which customer class benefits the most from R&D could result in discriminatory charges upon a class of customers. To properly evaluate and test these claims for recovery will take significant review and a balancing of many interests that is more properly done in a base rate proceeding.

There are other problems with the Commission's proposal. Neither the Commission nor the consumers being allocated R&D expenses has direct access to evidence as to the specifics of these projects undertaken by GTI or the benefit of such projects to ratepayers. The details of the projects are necessary to determine the extent to which the projects are beneficial to ratepayers. Such information could be expensive to review, requiring substantial time to review. Such lengthy discovery is more amenable to a base rate proceeding than an annual surcharge proceeding.

The OCA submits that R&D expenses should be recovered through base rates where the reasonableness and prudence of R&D expenses can be evaluated by all parties involved and issues regarding the benefits of such expenses to customers, customer classes, and the Company can be thoroughly evaluated. The Commission's proposed surcharge mechanism does not adequately substitute for such base rate review.

III. CONCLUSION

For the reasons set forth above, the OCA respectfully requests that the Commission not adopt a Policy Statement which allows NGDCs to collect R&D expenditures through a surcharge mechanism. Instead, NGDCs should make reasonable and prudent R&D contributions and seek recovery of the prudent, just and reasonable costs of such R&D through base rates.

Respectfully submitted,

Denise G. Goulet
Senior Assistant Consumer Advocate
Lori A. Pantelich
Assistant Consumer Advocate

Counsel for:
Irwin A. Popowsky
Consumer Advocate

Office of Consumer Advocate
555 Walnut Street
Forum Place, 5th Floor
Harrisburg, PA 17101-1923
(717) 783-5048

DATED: July 9, 2001
*64605 wp

CERTIFICATE OF SERVICE

Re: Proposed Policy Statement Regarding Collection of
Research and Development Funds by Natural Gas Distribution Companies
Docket No. M-00011462

I hereby certify that I have this day served a true copy of the foregoing document, Comments, upon parties of record in this proceeding in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant), in the manner and upon the persons listed below:

Dated this 9th day of July, 2001.

SERVICE IN PERSON

Lawrence F. Barth
Law Bureau
Pa. Public Utility Commission
Commonwealth Keystone Bldg.
400 North Street
P.O. Box 3265
Harrisburg, PA 17120

Office of Trial Staff
Pa. Public Utility Commission
Commonwealth Keystone Bldg.
400 North Street
P.O. Box 3265
Harrisburg, PA 17120

Robert Rosenthal
Bureau of Fixed Utilities
Pa. Public Utility Commission
Commonwealth Keystone Bldg.
400 North Street
P.O. Box 3265
Harrisburg, PA 17120

SERVICE BY FIRST CLASS MAIL, POSTAGE PREPAID

Richard Bunn, President
Energy Association of Pennsylvania
301 APC Building
800 North Third Street
Harrisburg, PA 17102

Office of Small Business Advocate
Commerce Bldg., Suite 1102
300 North Second Street
Harrisburg, PA 17101

Lori A. Pantelich
Assistant Consumer Advocate
Denise C. Goulet
Senior Assistant Consumer Advocate

Counsel for
Office of Consumer Advocate
555 Walnut Street 5th Floor, Forum Place
Harrisburg, PA 17101-1923
(717) 783-5048

64612 wpd

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA. 17105-3265

Public Meeting held April 19, 2001

Commissioners Present:

John M Quain, Chairman
Robert K. Bloom, Vice Chairman
Nora Mead Brownell
Aaron Wilson, Jr.
Terrance J. Fitzpatrick

Proposed Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies	Docket Number: M-00011462

ORDER

BY THE COMMISSION:

A. Introduction

The Commission proposes to establish a policy statement which will provide for the continuing collection of funds from natural gas distribution company (NGDC) customers for research and development (R&D) costs associated with the Gas Technology Institute (GTI), the new corporate name of the merged (June 2000) Gas Research Institute (GRI) and the Institute of Gas Technology. For many years, natural gas research and development (R&D) has been funded, in part, through volumetric charges assessed by interstate natural gas pipeline companies on services provided to Pennsylvania natural gas distribution companies (NGDCs) and others at rates regulated by the Federal Energy Regulatory Commission (FERC). The Commission has generally treated these interstate pipeline surcharges as a cost of natural gas and allowed Pennsylvania natural gas distribution companies to recover them through purchased gas cost rates set pursuant to 66 Pa. C.S §1307(e) or §1307(f).

In January 1998, the FERC approved a settlement among the GRI, the regulated pipelines, and their customers which will phase out this surcharge over six years and eliminate it altogether in 2005. As the phase out progresses, the size of the surcharge will continue to shrink, creating an increasing shortfall in this aspect of research and development funding relative to the 1998 pre-settlement level. The "shortfall" arises as a result of the absence of a mechanism for the collection from customers of a portion of the annual GTI dues that are paid by each NGDC.

By Order entered on June 8, 2000, this Commission denied a petition of the Pennsylvania Gas Association (now part of the Energy Association of Pennsylvania) at P-00991738 that sought the issuance of a policy statement which would authorize the funding of research and development costs through a surcharge mechanism pursuant to 66 Pa. C.S. §1307(a). This surcharge mechanism was proposed by the Pennsylvania Gas Association (PGA) as a response to the FERC-approved settlement of January 1998 in order to fund the shortfall of R&D cost recovery during the phase out period.

Although the Commission recognized the underlying value of natural gas research and development in Pennsylvania, we had concerns with the particular proposal. First, the mechanism proposed by the PGA would have imposed the full burden of funding research and development projects on non-competitive captive customers. The Commission was persuaded that forcing non-competitive residential and small commercial customers to pay all GTI R&D costs is inimical to the spirit of the FERC Order and is both unfair and inappropriate. Second, the

Commission concluded that funding through base rates, rather than via an automatic adjustment clause, would enable us to examine the nature of the proposed research and the potential benefits. In particular, the Commission was opposed to the creation of a mechanism that guarantees full recovery of R&D expenses while limiting our ability to review these costs in the context of a rate case under section 1308 of the Public Utility Code. 66 Pa. C.S. §1308.

B. Policy Statement

The Commission believes that various aspects of GTI R&D are of value to Pennsylvania natural gas consumers. In particular, the Commission is aware that the core R&D elements include efforts to: 1) enhance health and safety, 2) increase gas system reliability or integrity, 3) enhance environmental quality, 4) lower gas industry operating and maintenance costs, 5) increase gas supply from emerging resources, and 6) increase efficiency. Given the value of natural gas research and development, as well as the potential benefits to Pennsylvania natural gas consumers resulting from such projects, the Commission has considered whether funding might be provided in a fair and appropriate manner that enables a continuation of these projects. Specifically, the Commission is exploring the possibility of establishing a mechanism that permits the NGDCs to continue recovering a significant portion of these costs while eliminating the major flaws of the prior PGA proposal.

To that end, the Commission proposes in Annex A to allow NGDCs to collect a portion of the shortfall created by the phased elimination of the federal R&D surcharge, through a 1307(a) mechanism assessed on all customer classes benefiting from the projects. Under the Commission's proposal, following the six-year phase-out period, GTI costs would be recoverable only through base rates pursuant to Section 1308.

In an effort to permit the NGDCs to recover a substantial portion of the shortfall resulting from the phased elimination of the federal R&D surcharge, while also imposing some of the funding burden on shareholders, the Commission further proposes a sharing approach. Specifically, during the six-year phase out period, shareholders of each NGDC would be responsible for twenty-five (25) % of the expense associated with GTI–related R&D expense that is currently not recovered through its 1307(f) gas cost mechanism or its base rates. At the end of the phase-out period (2005), no further recovery through a 1307(a) mechanism would be permitted, but each NGDC could request Commission approval to roll 75% of its Gas Technology Institute (GTI) R&D expenses into base rates.

Additionally, to avoid the concerns raised by imposing this charge on only captive customers, the Commission's proposal would obligate the NGDC to attempt to match R&D expense recovery with the customer class accruing the majority benefit of the package of R&D programs selected by NGDC management. This would be accomplished by a review of each NGDC's package of GTI R&D projects to determine if it is reasonable to conclude that one customer class will receive the majority of the benefits of the overall GTI package. Absent a link to a particular customer class or classes, the R&D cost recovery both during and after the phase-out period would be applied to all customers on a throughput volumetric basis.

All interested parties are invited to submit comments on the proposal set forth in Annex A. Further, the NGDCs are particularly encouraged to provide input with respect to an appropriate shortfall recovery formula as well as a mechanism for determining a majority beneficiary.

We propose to amend Chapter 69 of our regulations by adding Section 69.1301 as set forth in Annex A hereto, which establishes a policy statement for the Collection of Research and Development Funds by NGDCs. Accordingly, pursuant to sections 501 of the Public Utility Code, 66 Pa. C.S. §501, and the Commonwealth Document Law, 45 P.S. §§1201 *et seq.*, and regulations promulgated thereunder at 1 Pa. Code §§7.1-7.4, we amend the regulations at 52 Pa. Code §69 as noted above and as set forth in Annex A; **THEREFORE,**

IT IS ORDERED:

1. That the proposed amendments to 52 Pa. Code Chapter 69, as set forth in Annex A hereto, are issued for comment.

2. That the Secretary shall submit this order and Annex A to the Governor's Budget Office for review of fiscal impact.

3. That the Secretary shall certify this order and Annex A and deposit them with the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin.*

4. That interested persons may submit an original and 15 copies of written comments to the Office of the Secretary, Pennsylvania Public Utility Commission. P.O. Box 3265, Harrisburg, PA, 17105-3265, within 30 days from the date this order is published in the *Pennsylvania Bulletin.* A copy of written comments shall also be served upon the Commission's Bureau of Fixed Utility Services.

5. That a copy of this Order and any accompanying statements of the Commissioners be served upon the Energy Association of Pennsylvania and made available, upon request, to all other interested parties.

6. That a copy of this Order shall be posted on the Commission's website.

7. The contact Persons for this Matter are Robert Rosenthal, Bureau of Fixed Utility Services, (717) 783-5242 (technical) and Lawrence Barth, Law Bureau, (717) 772-8579 (legal).

BY THE COMMISSION,

James J. McNulty
Secretary

(SEAL)

ORDER ADOPTED: April 19, 2001

ORDER ENTERED: April 20, 2001

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

In the Matter of the Application of Columbia Gas of Pennsylvania, Inc. for a Certificate of Public Convenience Evidencing Approval under Section 1102(a)(3) of the Public Utility Code of the Transfer from Columbia Energy Group to NiSource Inc. Or New NiSource Inc., by Merger, of the Title to and Possession and Use of All Property of Columbia Gas of Pennsylvania, Inc.	:	Docket No. A-120700F0003

RECOMMENDED DECISION

Before
GEORGE M. KASHI
Administrative Law Judge

I. HISTORY OF THE PROCEEDING

On March 30, 2000, Columbia Gas of Pennsylvania, Inc. ("Columbia") filed an Application with the Pennsylvania Public Utility Commission ("Commission" or "PUC") Through this Application, Columbia requests Commission approval of a merger transaction between NiSource Inc. ("NiSource") and Columbia Energy Group ("CEG") by which NiSource or New NiSource Inc. ("New NiSource") will acquire all of the stock of CEG and thus indirectly acquire title to, and possession and use of, all tangible and intangible property of Columbia which is used and useful in the public service.

The proposed transaction provides for the combination of NiSource and CEG involving the creation of a new holding company by NiSource, currently named New NiSource. Under the Merger Joint Petition for Settlement, two subsidiaries of New

NiSource, NiSource Acquisition Corp. and Columbia Acquisition Corp., will acquire the stock of both CEG and NiSource. NiSource Acquisition Corp. and Columbia Acquisition Corp. will be merged with and into NiSource and CEG respectively. NiSource and CEG will each become wholly-owned subsidiaries of New NiSource. Columbia will remain a wholly-owned subsidiary of CEG and will continue to be headquartered in Pittsburgh. Pursuant to the Joint Petition for Settlement and in consideration of the merger, CEG shareholders will receive $70 in cash plus a $2.60 face value SAILS℠ (a unit consisting of a zero coupon debt security with a forward equity contract), for each share of CEG common stock. In lieu of cash and SAILS℠, CEG shareholders may also elect to receive New NiSource stock in a tax-free exchange, for up to 30% of the outstanding CEG shares. Under this common stock alternative, each CEG share will be exchanged for $74 in New NiSource stock, subject to a collar. After consummation of the merger, Applicants expect New NiSource to become a registered holding company under the Public Utility Holding Company Act of 1935 (PUHCA)

Columbia notified its customers of the filing of the Application by bill insert commencing April 20, 2000 and May 19, 2000. The bill insert informed customers of the Merger agreement and informed customers that Columbia was seeking the Commission's approval of the Merger. It also informed customers that they should direct any comments regarding the Application to the Commission. No customer complaints were received.

On April 15, 2000, the Commission caused a notice of the filing of Columbia's Application to be published in the *Pennsylvania Bulletin* (30 *Pa. Bulletin* 2004), which allowed interested parties until May 1, 2000 to file protests and petitions to intervene.

The Office of Trial Staff ("OTS") entered its appearance on April 4, 2000. On April 27, 2000, the Office of Consumer Advocate ("OCA") filed a Notice of Intervention and Protest The Office of Small Business Advocate ("OSBA") filed a Notice of Intervention and Public Statement on May 3, 2000 pursuant to the provisions of the Small Business Advocate Act, Act 181 of 1988, 73 P.S. §§399–41 - 399.50 ("the Act"). On April 20, 2000 Allegheny Energy Supply Company, LLC ("AESC") requested that it be granted intervention in the above-captioned application.[1] On April 20, 2000 a Petition to Intervene was filed by Allegheny Power ("Allegheny Power"). A Petition to Intervene was also filed by the Columbia Industrial Intervenors ("CII") on April 27, 2000. On May 1, 2000 the United steelworkers of America, AFL-CIO-CLC ("Steelworkers"), the Utility Workers Union of America, AFL-CIO ("UWUA"), the Paper, Allied-Industrial, Chemical and Energy Workers International Union, AFL-CIO-CLC ("PACE"), and the Pennsylvania locals of the Steelworkers and UWUA that represent employees of the merging companies (collectively, Union Intervenors) petitioned to intervene and protested the application.

The matter was assigned to this administrative law judge on April 21, 2000 and a prehearing conference was scheduled for and held before the undersigned on Thursday, May 4, 2000. Prehearing Memoranda were submitted by OTS, OCA, OSBA and the Company. By and large the statutory parties are participating in order to ensure that the restructuring and merger are approved by the Commission only if (1) it is found to be in the public interest; (2) it provides substantial, affirmative benefits to Columbia's ratepayers; (3) it does not adversely affect retail competition in Pennsylvania; and (4) it is in accordance with the Public Utility Code.

On May 3, 2000 Applicant filed the prepared direct testimony (Columbia Statement No.4) and Exhibit No. JW-1 of witness Jamie Welsh. Under separate cover applicant filed Mr. Welsh's Exhibit Nos. JW-2 and JW-3 for which applicant sought confidential treatment. We issued a protective order on May 3, 2000 covering the confidential items. On April 25, 2000 Columbia filed the prepared direct testimony of Terrence J. Murphy (Columbia Statement No. 1). Columbia also filed the prepared direct

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[1] AESC later withdrew its intervention.

testimony of Mark T. Massel (Columbia Statement No. 2). On June 14, 2000 Columbia filed the prepared supplemental testimony of Mark T. Massel (Columbia Statement No.2A). On June 22, 2000 Columbia filed the Joint Petition for Settlement (Joint Petition) Attached hereto and made part hereof as Attachment 1. Under cover letter dated June 26, 2000 Columbia also filed for inclusion in the record the testimony and exhibits of Dr. Hieronymus at FERC Docket No.EC00-75-000, (Columbia Statement No.3) concerning approval of the merger by FERC. Additionally, direct testimony was filed by the Union Intervenors. See Appendix "A" to the Joint Petition for a list of all items stipulated into the record.

At the prehearing conference we granted the petitions to intervene set forth above. After an off the record discussion a schedule was agreed to by the parties which included a time frame for intensive negotiations. Those negotiations have proven fruitful and on June 22, 2000 the Company filed a Joint Petition for our consideration and recommendation to the Commission. Additionally, Statements in Support of the Joint Petition were filed by OCA, OSBA and the Company. Allegheny Power filed a statement saying that it did not oppose the Joint Petition We specifically note that upon our approval the parties have agreed to waive the exception period to allow the Commission to consider the matter more expeditiously. Specifically the parties request that both we and the Commission approve this Settlement by July 13, 2000.

II. TERMS AND CONDITIONS

The Joint Petitioners agree to settle and resolve issues in the above-captioned proceeding on the following terms and conditions:[2] Columbia's Application in the above-captioned proceeding will be granted and approved. The Joint Petitioners

[2] We refer the reader to the Joint Petition for complete reading.

agree to request that the Administrative Law Judge and the Commission approve this Settlement by July 13, 2000.

1. Columbia will not be permitted to increase base rates prior to January 1, 2004, as defined in Section 2211(a) of the Public Utility Code and subject to the exceptions set forth in Section 2211(d) of the Public Utility Code. Each other Joint Petitioner agrees that it will not file a complaint seeking a reduction in Columbia's base rates or otherwise seek or support any reduction in Columbia's base rates prior to January 1, 2004. The Commission will not institute, on its own motion, an investigation into the base rates of Columbia prior to January 1, 2004. Nothing contained herein shall prohibit ~~the deferral~~ or recovery of consumer education costs pursuant to Sections 2206(e) and 2211(d) of the Public Utility Code to the extent such consumer education costs are not recovered as the result of the Company's restructuring proceeding at R-00994781.

2. Columbia will not seek recovery, in any future rate proceeding, of costs incurred to close the Merger whether incurred directly or through a service corporation. Costs to close the Merger shall include filing fees, accountants' fees, legal fees, shareholder communication and proxy solicitation expenses, stock exchange listing fees, printing and engraving of stock certificates, investment banking fees and expenses, underwriting fees and expenses associated with issuances of securities to consummate the Merger, legal and consulting fees associated with obtaining regulatory approvals and executive severance costs. Columbia will employ normal accounting procedures to capitalize or expense all other expenditures incurred prior to and after the closing The Joint Petitioners may challenge the recovery of charges from affiliates in future rate proceedings, on the grounds that such charges result from the affiliate's use of accounting practices or procedures which could not have been properly employed by Columbia under this Settlement.

3. Columbia will be permitted to record on its books of account a ratable portion of the acquisition premium resulting from the Merger: provided, however, the recording of any amount for such acquisition premium on Columbia's books of account shall have no effect on the ratemaking treatment of such amount in future rate proceedings. Columbia foregoes any claim for recovery of the acquisition premium in any future rate proceeding. Columbia agrees that any effect on its capital structure or that of its parent Columbia Energy resulting from recording the acquisition premium on either Company's books of account will have no effect on, and will be removed from, the capital structure used for ratemaking purposes.

4. Columbia will maintain books and records, continuing property records and depreciation records on a basis separate from its parent and affiliates. The books and records and personnel of Columbia shall be accessible to the Commission and the Joint Petitioners to the extent provided by law during reasonable business hours. If the books and records of its parent company or of any other company within the system created by the merging companies become relevant to the jurisdictional rates or tariffed services of Columbia or relevant to material and specific code of conduct complaints brought to the attention of the Commission, or upon a complaint filed at the Commission necessitating their view, such relevant books and records as required by the Commission will also be made accessible to the Commission and the complaining party through photocopying or electronically where practicable or for review at the location where they are kept.

5. Columbia will present a class cost of service study in its next base rate proceeding reflecting the separate records referenced in Paragraph 13 of this Settlement.

6. Columbia will file a tariff supplement designed to encourage distributed generation for residential customers, commercial customers, and industrial

customers who do not qualify for service under Rate CDS – Cogeneration Distribution Service, by November 1, 2000. Columbia agrees to meet with the parties for discussion of such a tariff supplement prior to making that filing. All Joint Petitioners reserve the right to file complaints and/or comments with regard to such tariff supplement. NiSource and Columbia agree to conduct, with the cooperation of OCA, OTS and OSBA, a distributed generation demonstration project at one residential and one small commercial location in Columbia's service territory. The project will commence approximately three months after the later of the Commission's approval of the revisions to the tariff or the availability of necessary technology. It is expected that a fuel cell or other gas consuming equipment used to generate electricity will be installed at one residential and one small commercial location. The project will run for a period of one year. NiSource and Columbia will file a report on the project results within three months of the end of the one year period

7. The record in this proceeding will include Columbia's Application, Columbia's Direct Testimony and accompanying exhibits, Columbia's Supplemental Direct Testimony and Dr. Hieronymous's study of the effects of the Merger on competition as filed with FERC. The Joint Petitioners agree that the Application, testimony and exhibits as listed in Appendix "A" of the Joint Petition shall be stipulated into the record in this proceeding.

8. Columbia's headquarters will remain in Pittsburgh, Pennsylvania and its principal corporate officers will continue to be stationed in Pennsylvania for a period of at least five (5) years; provided however, that nothing in the Settlement shall be construed to prohibit such officers from holding positions as officers or directors of affiliated corporations Columbia will maintain an organization and staffing plan which provides for adequate, efficient staffing of the utility business and is designed to protect against the loss of talent from the regulated operations Before laying off or terminating more than one percent (1%) of its non-management workforce in one year during the

three-year period following completion of the Merger, Columbia will file a report with the Commission containing sufficient information to show that with the reduction of employees, Columbia will still be able to ensure the safety and reliability of natural gas distribution service to all retail gas customers, as provided in standards adopted by the Commission pursuant to its statutory authority.

9. Columbia reiterates its commitment to expansion of its Customer Assistance Program in accordance with the Joint Petition for Settlement of Winter Heating Season Rates and of Universal Service Program Extension, as approved by Order of the Commission dated October 15, 1999, and the Joint Petition for Settlement of Restructuring Filing, as approved by Order of the Commission dated December 17, 1999, both at Docket No. R-00994781.

10. NiSource represents that Columbia is considered a core business asset; that it intends to retain Columbia; and that it has no plans to dispose of Columbia to a third party following the Merger.

11. Following the Merger, the combined company will be part of a registered holding company pursuant to the 1935 Act and the regulations of the Securities and Exchange Commission ("SEC") adopted thereunder. There will, therefore, be no change in the procedures governing accounting for affiliate transactions which procedures currently must comply with the regulations of the SEC concerning accounting and pricing protocols. To the extent that Columbia enters into any new Joint Petition for Settlements with any affiliated interests, it will seek the necessary approvals from the Commission under Chapter 21 of the Public Utility Code.

Columbia will not guarantee the debt or credit instruments of NiSource or Columbia Energy or any subsidiary of NiSource or Columbia Energy not regulated by a state public utility commission or FERC ("unregulated subsidiaries"), nor will Columbia permit its property to be used to secure loans or credit instruments of NiSource, Columbia Energy or any of their unregulated subsidiaries without the approval of the Commission.

Columbia will not lend or provide credit to NiSource or Columbia Energy or any other unregulated subsidiaries without approval of the Commission. Columbia may participate in a credit facility (such as a money fund for short term debt) with NiSource and/or Columbia Energy and their regulated subsidiaries that complies with the rules of the SEC.

12. Columbia and NiSource agree that all affiliated companies, including direct and indirect subsidiaries of NiSource, shall be subject to the Commission's Code of Conduct to the extent they engage in activities within the scope of such rules.

13. Columbia and NiSource will not seek to overturn, reverse, set aside, change or enjoin, whether through appeal or the initiation or maintenance of any action in any forum, a decision or order of the Commission that pertains to recovery, disallowance, allowance, deferral or ratemaking treatment of any expense, charge, cost, or allocation incurred or accrued by Columbia as a result of a contract, Joint Petition for Settlement, arrangement, or transaction with any affiliate, associate, holding, mutual service or subsidiary company on the basis that such expense, charge, cost, or allocation has itself been filed with or approved by the SEC, or was incurred pursuant to a contract, arrangement, Joint Petition for Settlement or allocation which was filed with or approved by the SEC.

14. Columbia agrees to work with the OCA in the development of an OCA Customer Choice Shopping Guide which compares prices and terms of service offered to residential customers with Columbia's price to compare. Columbia agrees to

provide information that it is authorized to release and necessary assistance to the OCA on at least a quarterly basis. Any Shopping Guide that is developed will state that it is prepared by the OCA. The use and dissemination of any Shopping Guide developed will be through the OCA. Columbia may distribute any Shopping Guide developed to its customers after consultation with the OCA but is not required to distribute the Shopping Guide as part of this Settlement

15. Columbia and NiSource agree to continue at least Columbia's historic levels of charitable contributions and support for civic efforts for five years following the closing of the Merger. Such contributions shall be of the same nature and be made to organizations serving the general geographical locations as have been made in the past.

16. Columbia and NiSource agree that they will not seek recovery of any increase in the cost of capital to Columbia that results from the Merger

17. Columbia will strive to improve customer service following completion of the Merger. Columbia agrees to track the level of its performance for a period of three years following the Merger and to compare such performance to Columbia's historic performance in the following areas: (1) percent of calls answered within thirty seconds, (2) average busy-out rate, (3) percent of meters read within the parameters of Chapter 56 of the Pennsylvania Code, and (4) percent of emergency calls responded to in less than one hour (or less if required by the Commission). Columbia will file annual reports with the Commission for that three-year period providing the comparison of actual to historic performance. Columbia will identify in the reports any service innovations or best practices implemented following closing of the Merger. Such reports will be filed three months after the end of each one-year period and will be provided to any Joint Petitioner or Joint Petitioners upon request. In the event that Columbia's performance in any of the above-mentioned areas declines by 10% or more

19. The consummation and closing of the Merger shall constitute conditions precedent to the Settlement and all obligations of the Joint Petitioners hereunder, and Columbia and the other Joint Petitioners shall not be bound by the terms hereof until such time as the Merger is closed.

20. Following completion of the Merger, the combined company will maintain a presence in PECO Energy Company's electric choice program and Columbia's natural gas choice program, either through an affiliated company or a contractual arrangement with a third party, for a period of at least one year.

21. This Settlement is conditioned upon the Commission's approval of the terms and conditions contained herein without modification. If the Commission modifies the Settlement, then any Joint Petitioner may elect to withdraw from this Settlement and may proceed with litigation and, in such event, this Settlement shall be void and of no effect. Such election to withdraw must be made in writing, filed with the Secretary of the Commission and served upon all Joint Petitioners within five (5) business days after the entry of an order modifying the Settlement. This Settlement is proposed by the Joint Petitioners to settle all issues in the instant proceeding. The Settlement is made without any admission against, or prejudice to, any position which any Joint Petitioner to this Settlement may adopt in the event of any subsequent litigation of this proceeding or any other proceeding unless that proceeding involves Columbia to the extent matters resolved by this Settlement are an issue in that Columbia proceeding. If the Commission does not approve the Settlement and the proceedings continue to further hearings, the Joint Petitioners reserve their respective rights to conduct full cross-examination and briefing

22. The Joint Petitioners agree that this Settlement shall not constitute or be cited as controlling precedent in any other proceeding, including any other proceeding involving a merger or acquisition involving another Pennsylvania public utility, with the

exception that the Settlement, if adopted, will bind the Joint Petitioners in any future proceeding involving Columbia to the extent matters resolved by this Settlement are an issue in such proceeding.

23. If the ALJ adopts the Settlement without modification, the Joint Petitioners waive their rights to file briefs or exceptions.

III. DISCUSSION

We have reviewed the Joint Petition for Settlement, the testimony submitted and the statements filed in support of the Joint Petition and find that by and large ensures that the restructuring and merger, which we recommend for approval by the Commission, (1) is in the public interest; (2) it provides substantial, affirmative benefits to Columbia's ratepayers; (3) it does not adversely affect retail competition in Pennsylvania; and (4) it is in accordance with the Public Utility Code. These issues formed the basis of our discussion and are reflected in our decision.

We refer the reader to the statements in support of the Joint petition filed by OSBA, OCA and the Companies attached to this recommended decision Our discussion is taken largely from those documents. While OTS, CII, and the Union Intervenors did not file statements in support this does not in any way indicate any lack of support on their part. The mere signing of the Joint Petition by these parties clearly indicates their belief that the matter has been resolved in the public interest. Allegheny Power filed a letter saying it neither supported nor opposed the Joint Petition.

All parties are strong supporters of the use of collaborative processes to develop resolutions of regulatory proceedings. Numerous settlement discussions held by the parties resolved the various concerns of the parties. As a result of these collaborative efforts, a settlement in principle was reached which resolves all issues in the case. All parties believe that the Joint Petition resolves the issues in this proceeding in a manner following the completion of the Merger, falls below any standard prescribed by the Commission or falls below the average as reported by the Commission for Pennsylvania natural gas distribution companies subject to Section 1307(f) of the Public Utility Code, Columbia will meet with any one or more of the Joint Petitioners, upon the request of such Joint Petitioner or Joint Petitioners, to discuss whether a remedy is needed, and if so, what remedy is appropriate and how it should be implemented. The Joint Petitioners retain their right to file a complaint in accordance with Commission regulations for any alleged violation of a tariff, regulation, Commission order, or provision of the Public Utility Code. Nothing herein is intended to limit any authority of the Commission, or any of its bureaus, to perform their duties or make recommendations concerning Columbia's performance in any of the areas enumerated above.

In addition to items (1) through (4) enumerated above, Columbia will keep the following statistics for three years following Merger and will also compare those statistics to its historic experience:

(5) Number of accidental interruptions of service involving more than one thousand (1,000) customers for a duration of more than twelve (12) hours.

(6) Number of fines for violations of environmental, employee health and safety, pipeline safety, or employment laws and regulations.

(7) Number of preventable vehicle accidents.

(8) Number of lost time injuries.

(9) Ratio of meters actually read to those scheduled to be read during a cycle.

(10) Number of overtime hours worked.

(11) Number of incidents of facilities damage due to mismarking of facilities.

(12) Ratio of footage of plastic pipe to total footage of pipe.

(13) Number of service orders worked per service person.

These statistics will be included in the above-referenced annual reports to the Commission. In the event that (a) the statistics described in subparagraphs (5) or (6) increase by more than two (2) for any given year, (b) the statistics described in subparagraphs (7) or (8) increase by more than twenty-five percent (25%), (c) the statistics described in subparagraphs (9) or (12) decrease by more than ten percent (10%), or (d) the statistics described in subparagraph (11) increase by more than ten percent (10%). Columbia will meet with any one or more of the Joint Petitioners, upon the request of such Joint Petitioner or Joint Petitioners, to discuss whether a remedy is needed, and if so, what remedy is appropriate and how it should be implemented. Although Columbia has agreed to report the statistics described in subparagraphs (10) and (13) above, it makes no commitment to hold discussions with respect to those items. The Joint Petitioners retain their right to file a complaint in accordance with Commission regulations for any alleged violation of a tariff, regulation, Commission order, or provision of the Public Utility Code. Nothing herein is intended to limit any authority of the Commission, or any of its bureaus, to perform their duties or make recommendations concerning Columbia's performance in any of the areas enumerated above.

18 Columbia agrees that all gas costs savings achieved as a result of the Merger shall be passed through to customers through the Purchased Gas Cost Rider.

that is in the interest of all concerned parties while avoiding the time and expense of litigation.

We believe, as submitted by the parties, that the Joint Petition will produce an expedited resolution of the proceeding and permit other federal regulatory approval processes to proceed on an expedited basis. We find that the Joint Petition clarifies procedures to be used by Columbia in recording costs associated with the merger and eliminates issues related to the merger costs which might otherwise arise in future rate proceedings involving Columbia.

Importantly, as part of the Settlement, Columbia has agreed to extend the rate cap on its non-gas costs as set forth in Section 2211(a) of the Natural Gas Choice and Competition Act through January 1, 2004, subject to exceptions contained in Section 2211(d) of the Public Utility Code, while providing Columbia with assurances that investigations into base rates will not be initiated during the transition period following the merger. Settlement, ¶10 Additionally, the Company has agreed that it will not seek recovery of any costs to close the merger in a future proceeding. Settlement, ¶11.

Thus, during this extended rate cap period, the Company will absorb the costs to close the merger and ratepayers will not be required to pay these costs in any future rates. In addition, the Company has agreed that it will not defer costs to achieve the merger savings that are normally expensed. As a result, ratepayers will not be burdened by expenses to achieve the merger at the expiration of the rate cap period. In addition, for those costs normally capitalized and amortized, such amortizations will begin during the extended rate cap period which will mitigate the burden of such costs, if any, for ratepayers and maximize the benefits for ratepayers. Columbia has also agreed that ratepayers will not be required to pay charges related to the merger from Columbia's service affiliate that are not accounted for in a manner consistent with the settlement.

Columbia also has agreed that it will not claim an acquisition premium in any future rate proceeding and that the accounting treatment of the acquisition premium on the Company's books will not effect the Company's capital structure for ratemaking purposes. Settlement, ¶12.

Additionally, any gas cost savings achieved as a result of the merger will be immediately passed through to ratepayers through the Purchased Gas Cost Rider. Settlement, ¶27. Thus, if Columbia is able to achieve savings in its gas costs, these will immediately benefit ratepayers.

The Company has also agreed that it will seek to improve customer service following the completion of the merger. Settlement, ¶26. The Company will also report on the introduction of service innovations that are anticipated to result from the merger The Company has agreed to report on its efforts in this regard, including its performance in areas of customer call center availability, meter reading, compliance with Commission requirements, emergency response times, service interruptions and worker safety, and to work with the parties if the Company's service quality experiences a decline following the merger or fails to exceed the average for other NGDC's of similar size. Settlement, ¶26.

Another important feature of the Settlement are the provisions addressing various corporate protections. Settlement, ¶¶13, 20, 22. These protections are designed to ensure that Columbia's distribution ratepayers are protected from the risks associated with any diversified businesses and to avoid cross-subsidization of other affiliates. In addition, the agreements ensure the Commission's continuing jurisdiction and the Commission's access to the books, records and personnel necessary to the Commission's regulatory oversight responsibility.

Through this Settlement, Columbia has also reaffirmed its commitment to the expansion of its universal service programs in accordance with the settlements arising from Columbia's restructuring proceedings. Settlement, ¶18. These prior settlements call for a substantial expansion of Columbia's universal service programs. Columbia's commitment here ensures that the merger will not adversely affect the expansion of these programs in a timely manner.

The Settlement contains several provisions that should assist in the development of competition in Columbia's service territory. First, Columbia has agreed to work with the OCA to develop a shopping guide for residential customer use in its service territory. Settlement, ¶23. This shopping guide is intended to provide necessary and valuable information to residential customers so that customers can make an informed choice regarding the supplier of their natural gas supply. Second, the Settlement ensures that Columbia's Code of Conduct applies to all affiliated companies, including direct and indirect subsidiaries of NiSource. Settlement, ¶21. With this provision, there will be no uncertainty as to the applicability of the Code of Conduct as the Companies combine their operations. Third, the Company has agreed that for a period of at least one year after the merger, the combined company will continue to participate in the electric choice program of PECO and the natural gas choice program of Columbia in which Columbia's current retail marketing affiliate is a participant. This will ensure that in the initial year after the merger, participation in these programs by these retail marketing affiliates continues. Settlement, ¶29.

In a related and important feature of the Settlement, the Settlement calls for Columbia to file tariff supplements for all customer classes designed to encourage distributed generation and to conduct a distributed generation demonstration project for a residential customer and a small commercial customer in Columbia's service territory. Settlement, ¶15. As Columbia set forth in its direct testimony in support of the Merger, one product offering that will impact both the electric and natural gas competitive markets will be the introduction of distributed generation. Columbia St. 2 at 23. Through this Settlement and Merger, Columbia will forward the progress toward the introduction of this important product.

Columbia will be filing a tariff which will be designed to encourage the use of distributed generation for residential, commercial and industrial customers who do not qualify for service under Rate CDS - Cogeneration Distribution Service. NiSource and Columbia have also agreed to conduct a distributed generation demonstration project at one residential and one commercial location in Columbia's service territory. This will encourage the use of new technology by smaller customers. These conditions will result in greater benefits for smaller users. This will benefit all customers including Columbia's small business customers.

Penultimately, the Joint Settlement secures Columbia's commitment to maintain its corporate presence in Pittsburgh for an extended period of time, and secures Columbia's commitment to maintain its charitable and community giving following the merger Settlement, ¶17, 24. The Settlement also provides for Columbia to maintain an organization and staffing plan which provides for adequate, efficient staffing of the utility business and protects against the loss of talent from the regulated operations as more opportunities become available in the merged company. Settlement, ¶17. These provisions are beneficial to the community by securing Columbia's commitment to remain within the community and they ensure that the regulated operations will be appropriately staffed.

Finally the Joint Petition protects customers by providing for filing of information that will permit the Commission to monitor service quality and provides a procedure to resolve issues concerning service quality if any significant reduction in service quality is perceived. The Companies note, however, that they believe that service quality will be enhanced by the merger and the Joint Petition provides that Columbia will identify best practices and service innovations instituted as a result of the merger.

Given the range of benefits provided by this Settlement, and the protections afforded to ratepayers, we accept what the OCA, OSBA and the Companies submit. We find that the Settlement provides substantial affirmative benefits to ratepayers and is in the public interest. We find nothing in it that adversely affects retail competition in Pennsylvania; and it is in accord with the Public Utility Code. Accordingly we will approve the Joint Petition and recommend its adoption and approval by the Commission.

IV. CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the subject matter and the parties.

2. The matter is properly before the Commission.

3. The Joint Petition For Settlement is in the public interest.

4. The Joint Petition For Settlement provides substantial, affirmative benefits to Columbia's ratepayers.

5. The Joint Petition For Settlement does not adversely affect retail competition in Pennsylvania.

6. The Joint Petition For Settlement is in accordance with the Public Utility Code

V. ORDER

THEREFORE,

IT IS ORDERED:

1. That Columbia shall not be permitted to increase base rates prior to January 1, 2004, as defined in Section 2211(a) of the Public Utility Code and subject to the exceptions set forth in Section 2211(d) of the Public Utility Code. Each other Joint Petitioner agrees that it will not file a complaint seeking a reduction in Columbia's base rates or otherwise seek or support any reduction in Columbia's base rates prior to January 1, 2004. The Commission will not institute, on its own motion, an investigation into the base rates of Columbia prior to January 1, 2004. Nothing contained herein shall prohibit the deferral or recovery of consumer education costs pursuant to Sections 2206(e) and 2211(d) of the Public Utility Code to the extent such consumer education costs are not recovered as the result of the Company's restructuring proceeding at R-00994781.

2. That Columbia shall not seek recovery, in any future rate proceeding, of costs incurred to close the Merger whether incurred directly or through a service corporation. Costs to close the Merger shall include filing fees, accountants' fees, legal fees, shareholder communication and proxy solicitation expenses, stock exchange listing fees, printing and engraving of stock certificates, investment banking fees and expenses, underwriting fees and expenses associated with issuances of securities to consummate the Merger, legal and consulting fees associated with obtaining regulatory approvals and executive severance costs. Columbia will employ normal accounting procedures to capitalize or expense all other expenditures incurred prior to and after the closing The Joint Petitioners may challenge the recovery of charges from affiliates in future rate proceedings, on the grounds that such charges result from the affiliate's use of

accounting practices or procedures which could not have been properly employed by Columbia under this Settlement.

3. That Columbia shall be permitted to record on its books of account a ratable portion of the acquisition premium resulting from the Merger; provided, however, the recording of any amount for such acquisition premium on Columbia's books of account shall have no effect on the ratemaking treatment of such amount in future rate proceedings. Columbia foregoes any claim for recovery of the acquisition premium in any future rate proceeding. Columbia agrees that any effect on its capital structure or that of its parent Columbia Energy resulting from recording the acquisition premium on either Company's books of account will have no effect on, and will be removed from, the capital structure used for ratemaking purposes.

4. That Columbia shall shall maintain books and records, continuing property records and depreciation records on a basis separate from its parent and affiliates. The books and records and personnel of Columbia shall be accessible to the Commission and the Joint Petitioners to the extent provided by law during reasonable business hours. If the books and records of its parent company or of any other company within the system created by the merging companies become relevant to the jurisdictional rates or tariffed services of Columbia or relevant to material and specific code of conduct complaints brought to the attention of the Commission, or upon a complaint filed at the Commission necessitating their view, such relevant books and records as required by the Commission shall also be made accessible to the Commission and the complaining party through photocopying or electronically where practicable or for review at the location where they are kept.

5. That Columbia shall present a class cost of service study in its next base rate proceeding reflecting the separate records referenced in Paragraph 13 of this Settlement.

6. That Columbia shall file a tariff supplement, designed to encourage distributed generation for residential customers, commercial customers, and industrial customers ~~who do not qualify~~ for service under Rate CDS – Cogeneration Distribution Service, by November 1, 2000. Columbia agrees to meet with the parties for discussion of such a tariff supplement prior to making that filing. All Joint Petitioners reserve the right to file complaints and/or comments with regard to such tariff supplement. NiSource and Columbia agree to conduct, with the cooperation of OCA, OTS and OSBA, a distributed generation demonstration project at one residential and one small commercial location in Columbia's service territory. The project shall commence approximately three months after the later of the Commission's approval of the revisions to the tariff or the availability of necessary technology. It is expected that a fuel cell or other gas consuming equipment used to generate electricity shall be installed at one residential and one small commercial location. The project shall run for a period of one year. NiSource and Columbia shall file a report on the project results within three months of the end of the one year period.

7. That the record in this proceeding includes Columbia's Application, Columbia's Direct Testimony and accompanying exhibits, Columbia's Supplemental Direct Testimony and Dr. Hieronymous's study of the effects of the Merger on competition as filed with FERC. The Joint Petitioners agree that the Application, testimony and exhibits as listed in Appendix "A" of the Joint Petition be and are hereby stipulated into the record in this proceeding.

8. That Columbia's headquarters shall remain in Pittsburgh, Pennsylvania and its principal corporate officers shall continue to be stationed in Pennsylvania for a period of at least five (5) years; provided however, that nothing in the Settlement will be construed to prohibit such officers from holding positions as officers or directors of affiliated corporations. Columbia shall maintain an organization and

staffing plan which provides for adequate, efficient staffing of the utility business and is designed to protect against the loss of talent from the regulated operations. Before laying off or terminating more than one percent (1%) of its non-management workforce in one year during the three-year period following completion of the Merger, Columbia shall file a report with the Commission containing sufficient information to show that with the reduction of employees, Columbia will still be able to ensure the safety and reliability of natural gas distribution service to all retail gas customers, as provided in standards adopted by the Commission pursuant to its statutory authority.

9. That Columbia reiterates its commitment to expansion of its Customer Assistance Program in accordance with the Joint Petition for Settlement of Winter Heating Season Rates and of Universal Service Program Extension, as approved by Order of the Commission dated October 15, 1999, and the Joint Petition for Settlement of Restructuring Filing, as approved by Order of the Commission dated December 17, 1999, both at Docket No R-00994781.

10. That NiSource considers Columbia a core business asset; that it intends to retain Columbia; and that it has no plans to dispose of Columbia to a third party following the Merger.

11. That following the Merger, the combined company will be part of a registered holding company pursuant to the 1935 Act and the regulations of the Securities and Exchange Commission ("SEC") adopted thereunder. There shall therefore be no change in the procedures governing accounting for affiliate transactions which procedures currently must comply with the regulations of the SEC concerning accounting and pricing protocols. To the extent that Columbia enters into any new Joint Petition for Settlements with any affiliated interests, it will seek the necessary approvals from the Commission under Chapter 21 of the Public Utility Code.

12. That Columbia shall not guarantee the debt or credit instruments of NiSource or Columbia Energy or any subsidiary of NiSource or Columbia Energy not regulated by a state public utility commission or FERC ("unregulated subsidiaries") nor shall Columbia permit its property to be used to secure loans or credit instruments of NiSource, Columbia Energy or any of their unregulated subsidiaries without the approval of the Commission.

13. That Columbia shall not lend or provide credit to NiSource or Columbia Energy or any other unregulated subsidiaries without approval of the Commission. Columbia may participate in a credit facility (such as a money fund for short term debt) with NiSource and/or Columbia Energy and their regulated subsidiaries that complies with the rules of the SEC.

14. That Columbia and NiSource agree that all affiliated companies, including direct and indirect subsidiaries of NiSource, shall be subject to the Commission's Code of Conduct to the extent they engage in activities within the scope of such rules.

15. That Columbia and NiSource shall not seek to overturn, reverse, set aside, change or enjoin, whether through appeal or the initiation or maintenance of any action in any forum, a decision or order of the Commission that pertains to recovery, disallowance, allowance, deferral or ratemaking treatment of any expense, charge, cost, or allocation incurred or accrued by Columbia as a result of a contract, Joint Petition for Settlement, arrangement, or transaction with any affiliate, associate, holding, mutual service or subsidiary company on the basis that such expense, charge, cost, or allocation has itself been filed with or approved by the SEC, or was incurred pursuant to a contract, arrangement, Joint Petition for Settlement or allocation which was filed with or approved by the SEC.

16. That Columbia shall work with the OCA in the development of an OCA Customer Choice Shopping Guide which compares prices and terms of service offered to residential customers with Columbia's price to compare. Columbia agrees to provide information that it is authorized to release and necessary assistance to the OCA on at least a quarterly basis. Any Shopping Guide that is developed will state that it is prepared by the OCA. The use and dissemination of any Shopping Guide developed will be through the OCA. Columbia may distribute any Shopping Guide developed to its customers after consultation with the OCA but is not required to distribute the Shopping Guide as part of this Settlement.

17. That Columbia and NiSource shall continue to at least Columbia's historic levels of charitable contributions and support for civic efforts for five years following the closing of the Merger. Such contributions shall be of the same nature and be made to organizations serving the general geographical locations as have been made in the past.

18. That Columbia and NiSource agree that they will not seek recovery of any increase in the cost of capital to Columbia that results from the Merger.

19. That Columbia shall strive to improve customer service following completion of the Merger. Columbia shall track the level of its performance for a period of three years following the Merger and to compare such performance to Columbia's historic performance in the following areas: (1) percent of calls answered within thirty seconds, (2) average busy-out rate, (3) percent of meters read within the parameters of Chapter 56 of the Pennsylvania Code, and (4) percent of emergency calls responded to in less than one hour (or less if required by the Commission) Columbia shall file annual reports with the Commission for that three-year period providing the comparison of actual to historic performance Columbia shall identify in the reports any service innovations or best practices implemented following closing of the Merger. Such reports

shall be filed three months after the end of each one-year period and will be provided to any Joint Petitioner or Joint Petitioners upon request. In the event that Columbia's performance in any of the above-mentioned areas declines by 10% or more following the completion of the Merger, falls below any standard prescribed by the Commission or falls below the average as reported by the Commission for Pennsylvania natural gas distribution companies subject to Section 1307(f) of the Public Utility Code, Columbia will meet with any one or more of the Joint Petitioners, upon the request of such Joint Petitioner or Joint Petitioners, to discuss whether a remedy is needed, and if so, what remedy is appropriate and how it should be implemented The Joint Petitioners retain their right to file a complaint in accordance with Commission regulations for any alleged violation of a tariff, regulation, Commission order, or provision of the Public Utility Code. Nothing herein is intended to limit any authority of the Commission, or any of its bureaus, to perform their duties or make recommendations concerning Columbia's performance in any of the areas enumerated above.

20. That in addition to items in subparagraphs (1) through (4) enumerated in paragraph 19 above, Columbia shall keep the following statistics for three years following Merger and will also compare those statistics to its historic experience:

(5) Number of accidental interruptions of service involving more than one thousand (1,000) customers for a duration of more than twelve (12) hours.

(6) Number of fines for violations of environmental, employee health and safety, pipeline safety, or employment laws and regulations.

(7) Number of preventable vehicle accidents.

(8) Number of lost time injuries.

(9) Ratio of meters actually read to those scheduled to be read during a cycle.

(10) Number of overtime hours worked.

(11) Number of incidents of facilities damage due to mismarking of facilities.

(12) Ratio of footage of plastic pipe to total footage of pipe.

(13) Number of service orders worked per service person.

These statistics shall be included in the above-referenced annual reports to the Commission. In the event that (a) the statistics described in subparagraphs (5) or (6) increase by more than two (2) for any given year, (b) the statistics described in subparagraphs (7) or (8) increase by more than twenty-five percent (25%), (c) the statistics described in subparagraphs (9) or (12) decrease by more than ten percent (10%), or (d) the statistics described in subparagraph (11) increase by more than ten percent (10%), Columbia will meet with any one or more of the Joint Petitioners, upon the request of such Joint Petitioner or Joint Petitioners, to discuss whether a remedy is needed, and if so, what remedy is appropriate and how it should be implemented. Although Columbia has agreed to report the statistics described in subparagraphs (10) and (13) above, it makes no commitment to hold discussions with respect to those items. The Joint Petitioners retain their right to file a complaint in accordance with Commission regulations for any alleged violation of a tariff, regulation, Commission order, or provision of the Public Utility Code. Nothing herein is intended to limit any authority of the Commission, or any of its bureaus, to perform their duties or make recommendations concerning Columbia's performance in any of the areas enumerated above.

21. That Columbia shall pass through all gas costs savings achieved as a result of the Merger to customers through the Purchased Gas Cost Rider.

22. That the consummation and closing of the Merger shall constitute conditions precedent to the Settlement and all obligations of the Joint Petitioners hereunder, and Columbia and the other Joint Petitioners shall not be bound by the terms hereof until such time as the Merger is closed.

23. That following completion of the Merger, the combined company will maintain a presence in PECO Energy Company's electric choice program and Columbia's natural gas choice program, either through an affiliated company or a contractual arrangement with a third party, for a period of at least one year.

24. That should the Commission modify the Settlement, then any Joint Petitioner may elect to withdraw from this Settlement and may proceed with litigation and, in such event, this Settlement shall be void and of no effect. Such election to withdraw must be made in writing, filed with the Secretary of the Commission and served upon all Joint Petitioners within five (5) business days after the entry of an order modifying the Settlement. This Settlement is proposed by the Joint Petitioners to settle all issues in the instant proceeding. The Settlement is made without any admission against, or prejudice to, any position which any Joint Petitioner to this Settlement may adopt in the event of any subsequent litigation of this proceeding or any other proceeding unless that proceeding involves Columbia to the extent matters resolved by this Settlement are an issue in that Columbia proceeding. If the Commission does not approve the Settlement and the proceedings continue to further hearings, the Joint Petitioners reserve their respective rights to conduct full cross-examination and briefing.

25. That this Settlement shall not constitute or be cited as controlling precedent in any other proceeding, including any other proceeding involving a merger or

acquisition involving another Pennsylvania public utility, with the exception that the Settlement, if adopted, will bind the Joint Petitioners in any future proceeding involving Columbia to the extent matters resolved by this Settlement are an issue in such proceeding.

26. That the Joint Petitioners waive their rights to file briefs or exceptions.

Dated: June 28, 2000

George M. Kashi
Administrative Law Judge

ATTACHMENT I

BEFORE
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

In the Matter of the Application of Columbia Gas of Pennsylvania, Inc for a Certificate of Public Convenience Evidencing Approval under Section 1102(a)(3) of the Public Utility Code of the Transfer from Columbia Energy Group to NiSource Inc. or New NiSource Inc., by Merger, of the Title to and Possession and Use of All Property of Columbia Gas of Pennsylvania, Inc	:	Docket No. A-120700F0003

JOINT PETITION FOR SETTLEMENT

TO ADMINISTRATIVE LAW JUDGE GEORGE M. KASHI:

This Joint Petition for Settlement ("Joint Petition") is submitted by the following parties in the above-captioned proceeding. Columbia Gas of Pennsylvania, Inc. ("Columbia" or the "Company"), the Office of Trial Staff ("OTS"); the Office of Consumer Advocate ("OCA"); the Office of Small Business Advocate ("OSBA"); Columbia Industrial Intervenors ("CII"), United Steelworkers of America ("Steelworkers"); Utility Workers Union of America ("UWUA"); Paper, Allied-Industrial, Chemical and Energy Workers International Union ("PACE"), the Pennsylvania locals of the Steelworkers and UWUA, and NiSource Inc. (hereafter collectively referred to as the "Joint Petitioners" or individually as "Joint Petitioner") [1]

The terms and conditions set forth in this Joint Petition represent a comprehensive settlement ("Settlement") and resolve all issues pertaining to the above-captioned Application The Joint Petitioners aver that this comprehensive Settlement is in the public interest and,

[1] Allegheny Power sought and was granted intervention in this proceeding and by separate letter will indicate that it does not join in but does not oppose the Settlement Allegheny Energy Supply Company LLC sought and was granted intervention and subsequently withdrew its intervention

therefore, request that the Pennsylvania Public Utility Commission ("Commission"): (1) approve without modification the proposed Settlement as set forth herein; and (2) issue the Certificate of Public Convenience and all necessary approvals as requested in Columbia's Application.

In support of their request, the Joint Petitioners state as follows:

I. BACKGROUND

1. This proceeding was initiated by the filing, on March 30, 2000, of the *Application of Columbia Gas of Pennsylvania, Inc. for a Certificate of Public Convenience Evidencing Approval under Section 1102(a)(3) of the Public Utility Code of the Transfer from Columbia Energy Group to NiSource Inc or New NiSource Inc., by Merger, of the Title to and Possession and Use of All Property of Columbia Gas of Pennsylvania, Inc.* (the "Application")

2. The Application provided for the combination of NiSource Inc. ("NiSource") and Columbia Energy Group ("CEG") As stated in the Application, NiSource is an energy and utility-based holding company currently organized under the laws of the State of Indiana CEG is a public utility holding company and is the parent company of Columbia. The combination of NiSource and CEG will involve the creation of a new holding company by NiSource, currently named New NiSource and organized under the laws of the State of Delaware New NiSource has formed two subsidiaries, Parent Acquisition Corp. and Company Acquisition Corp., to acquire the stock of CEG and NiSource, respectively. Under the Agreement, Parent Acquisition Corp. and Company Acquisition Corp will be merged with and into NiSource and CEG respectively NiSource and CEG will each become wholly-owned subsidiaries of New NiSource NiSource will subsequently be merged into New NiSource and New NiSource will be renamed NiSource.

Upon consummation of the Merger, CEG will be a wholly-owned subsidiary of NiSource. NiSource will become a registered holding company under the Public Utility Holding Company Act of 1935 (the "1935 Act"). Columbia will remain a wholly-owned subsidiary of CEG and, as provided in the Settlement, will continue to be headquartered in Pittsburgh, Pennsylvania for at least five years. Columbia and the other regulated operating subsidiaries of CEG will retain their separate corporate identities, names, assets and liabilities, franchises, and certificates of public convenience and necessity.

3. In the application, Columbia requested that the Commission grant a certificate of public convenience under section 1102(a)(3) of the Public Utility Code (66 Pa.C.S. § 1102(a)(3)) for the proposed Merger.

4 Columbia notified its customers of the filing of the Application by bill insert commencing April 20, 2000 and May 19, 2000. The bill insert informed customers of the Merger agreement and informed customers that Columbia was seeking the Commission's approval of the Merger. It also informed customers that they should direct any comments regarding the Application to the Commission. No customer complaints were received.

5. On April 15, 2000, the Commission caused a notice of the filing of Columbia's Application to be published in the *Pennsylvania Bulletin* (30 *Pa Bulletin* 2004), which allowed interested parties until May 1, 2000 to file protests and petitions to intervene.

6. On April 25, 2000, Columbia filed Prepared Direct Testimony and Exhibits of three of its Witnesses Additional direct testimony was filed on May 3, 2000. Supplemental Direct Testimony concerning the results of CEG's and NiSource's shareholder meetings was filed on June 14, 2000

7. The Commission assigned this matter to Administrative Law Judge George M Kashi to conduct hearings and issue an initial decision. A prehearing conference was held on Thursday May 4, 2000, at which various procedural matters were addressed and resolved, including the establishment of a schedule in the event that litigation of the proceeding proved necessary.

8. The first settlement and discovery conference was conducted on May 18, 2000. Pursuant to the schedule developed by the parties and approved by the ALJ, further extensive settlement conferences and negotiations were conducted from May 25 through June 9, 2000. On or about June 9, 2000, the Joint Petitioners reached the Settlement of all issues as set forth in this Joint Petition

II. TERMS AND CONDITIONS

The Joint Petitioners agree to settle and resolve issues in the above captioned proceeding on the following terms and conditions:

9. Columbia's Application in the above captioned proceeding will be granted and approved. The Joint Petitioners agree to request that the Administrative Law Judge and the Commission approve this Settlement by July 13, 2000.

10. Columbia will not be permitted to increase base rates prior to January 1, 2004, as defined in Section 2211(a) of the Public Utility Code and subject to the exceptions set forth in Section 2211(d) of the Public Utility Code Each other Joint Petitioner agrees that it will not file a complaint seeking a reduction in Columbia's base rates or otherwise seek or support any reduction in Columbia's base rates prior to January 1, 2004. The Commission will not institute, on its own motion, an investigation into the base rates of Columbia prior to January 1, 2004 Nothing contained herein shall prohibit the deferral or recovery of consumer education costs

pursuant to Sections 2206(e) and 2211(d) of the Public Utility Code to the extent such consumer education costs are not recovered as the result of the Company's restructuring proceeding at R-00994781

11. Columbia will not seek recovery, in any future rate proceeding, of costs incurred to close the Merger whether incurred directly or through a service corporation. Costs to close the Merger shall include filing fees, accountants' fees, legal fees, shareholder communication and proxy solicitation expenses, stock exchange listing fees, printing and engraving of stock certificates, investment banking fees and expenses, underwriting fees and expenses associated with issuances of securities to consummate the Merger, legal and consulting fees associated with obtaining regulatory approvals and executive severance costs Columbia will employ normal accounting procedures to capitalize or expense all other expenditures incurred prior to and after the closing The Joint Petitioners may challenge the recovery of charges from affiliates in future rate proceedings. on the grounds that such charges result from the affiliate's use of accounting practices or procedures which could not have been properly employed by Columbia under this Settlement

12. Columbia will be permitted to record on its books of account a ratable portion of the acquisition premium resulting from the Merger, provided, however, the recording of any amount for such acquisition premium on Columbia's books of account shall have no effect on the ratemaking treatment of such amount in future rate proceedings. Columbia foregoes any claim for recovery of the acquisition premium in any future rate proceeding Columbia agrees that any effect on its capital structure or that of its parent Columbia Energy resulting from recording the acquisition premium on either Company's books of account will have no effect on, and will be removed from, the capital structure used for ratemaking purposes.

13. Columbia will maintain books and records, continuing property records and depreciation records on a basis separate from its parent and affiliates The books and records and personnel of Columbia shall be accessible to the Commission and the Joint Petitioners to the extent provided by law during reasonable business hours. If the books and records of its parent company or of any other company within the system created by the merging companies become relevant to the jurisdictional rates or tariffed services of Columbia or relevant to material and specific code of conduct complaints brought to the attention of the Commission, or upon a complaint filed at the Commission necessitating their view, such relevant books and records as required by the Commission will also be made accessible to the Commission and the complaining party through photocopying or electronically where practicable or for review at the location where they are kept

14. Columbia will present a class cost of service study in its next base rate proceeding reflecting the separate records referenced in Paragraph 13 of this Settlement.

15. Columbia will file a tariff supplement, designed to encourage distributed generation for residential customers, commercial customers, and industrial customers who do not qualify for service under Rate CDS – Cogeneration Distribution Service, by November 1, 2000. Columbia agrees to meet with the parties for discussion of such a tariff supplement prior to making that filing. All Joint Petitioners reserve the right to file complaints and/or comments with regard to such tariff supplement NiSource and Columbia agree to conduct, with the cooperation of OCA, OTS and OSBA, a distributed generation demonstration project at one residential and one small commercial location in Columbia's service territory. The project will commence approximately three months after the later of the Commission's approval of the revisions to the tariff or the availability of necessary technology. It is expected that a fuel cell or

other gas consuming equipment used to generate electricity will be installed at one residential and one small commercial location. The project will run for a period of one year NiSource and Columbia will file a report on the project results within three months of the end of the one year period.

16. The record in this proceeding will include Columbia's Application, Columbia's Direct Testimony and accompanying exhibits, Columbia's Supplemental Direct Testimony and Dr. Hieronymous' study of the effects of the Merger on competition as filed with FERC The Joint Petitioners agree that the Application, testimony and exhibits as listed in Appendix "A" hereto shall be stipulated into the record in this proceeding.

17. Columbia's headquarters will remain in Pittsburgh, Pennsylvania and its principal corporate officers will continue to be stationed in Pennsylvania for a period of at least five (5) years, provided however, that nothing in the Settlement shall be construed to prohibit such officers from holding positions as officers or directors of affiliated corporations. Columbia will maintain an organization and staffing plan which provides for adequate, efficient staffing of the utility business and is designed to protect against the loss of talent from the regulated operations. Before laying off or terminating more than one percent (1%) of its non-management workforce in one year during the three-year period following completion of the Merger, Columbia will file a report with the Commission containing sufficient information to show that with the reduction of employees, Columbia will still be able to ensure the safety and reliability of natural gas distribution service to all retail gas customers, as provided in standards adopted by the Commission pursuant to its statutory authority.

18. Columbia reiterates its commitment to expansion of its Customer Assistance Program in accordance with the Joint Petition for Settlement of Winter Heating Season Rates and

of Universal Service Program Extension, as approved by Order of the Commission dated October 15, 1999, and the Joint Petition for Settlement of Restructuring Filing, as approved by Order of the Commission dated December 17, 1999, both at Docket No. R-00994781

19 NiSource represents that Columbia is considered a core business asset, that it intends to retain Columbia; and that it has no plans to dispose of Columbia to a third party following the Merger.

20. Following the Merger, the combined company will be part of a registered holding company pursuant to the 1935 Act and the regulations of the Securities and Exchange Commission ("SEC") adopted thereunder. There will therefore be no change in the procedures governing accounting for affiliate transactions which procedures currently must comply with the regulations of the SEC concerning accounting and pricing protocols To the extent that Columbia enters into any new agreements with any affiliated interests, it will seek the necessary approvals from the Commission under Chapter 21 of the Public Utility Code.

Columbia will not guarantee the debt or credit instruments of NiSource or Columbia Energy or any subsidiary of NiSource or Columbia Energy not regulated by a state public utility commission or FERC ("unregulated subsidiaries") nor will Columbia permit its property to be used to secure loans or credit instruments of NiSource, Columbia Energy or any of their unregulated subsidiaries without the approval of the Commission.

Columbia will not lend or provide credit to NiSource or Columbia Energy or any other unregulated subsidiaries without approval of the Commission. Columbia may participate in a credit facility (such as a money fund for short term debt) with NiSource and/or Columbia Energy and their regulated subsidiaries that complies with the rules of the SEC.

21. Columbia and NiSource agree that all affiliated companies, including direct and indirect subsidiaries of NiSource, shall be subject to the Commission's Code of Conduct to the extent they engage in activities within the scope of such rules.

22. Columbia and NiSource will not seek to overturn, reverse, set aside, change or enjoin, whether through appeal or the initiation or maintenance of any action in any forum, a decision or order of the Commission that pertains to recovery, disallowance, allowance, deferral or ratemaking treatment of any expense, charge, cost, or allocation incurred or accrued by Columbia as a result of a contract, agreement, arrangement, or transaction with any affiliate, associate, holding, mutual service or subsidiary company on the basis that such expense, charge, cost, or allocation has itself been filed with or approved by the SEC, or was incurred pursuant to a contract, arrangement, agreement or allocation which was filed with or approved by the SEC

23 Columbia agrees to work with the OCA in the development of an OCA Customer Choice Shopping Guide which compares prices and terms of service offered to residential customers with Columbia's price to compare. Columbia agrees to provide information that it is authorized to release and necessary assistance to the OCA on at least a quarterly basis Any Shopping Guide that is developed will state that it is prepared by the OCA The use and dissemination of any Shopping Guide developed will be through the OCA. Columbia may distribute any Shopping Guide developed to its customers after consultation with the OCA but is not required to distribute the Shopping Guide as part of this Settlement.

24. Columbia and NiSource agree to continue at least Columbia's historic levels of charitable contributions and support for civic efforts for five years following the closing of the Merger. Such contributions shall be of the same nature and be made to organizations serving the general geographical locations as have been made in the past

25 Columbia and NiSource agree that they will not seek recovery of any increase in the cost of capital to Columbia that results from the Merger.

26 Columbia will strive to improve customer service following completion of the Merger Columbia agrees to track the level of its performance for a period of three years following the Merger and to compare such performance to Columbia's historic performance in the following areas: (1) percent of calls answered within thirty seconds, (2) average busy-out rate, (3) percent of meters read within the parameters of Chapter 56 of the Pennsylvania Code, and (4) percent of emergency calls responded to in less than one hour (or less if required by the Commission). Columbia will file annual reports with the Commission for that three-year period providing the comparison of actual to historic performance. Columbia will identify in the reports any service innovations or best practices implemented following closing of the Merger Such reports will be filed three months after the end of each one-year period and will be provided to any Joint Petitioner or Joint Petitioners upon request. In the event that Columbia's performance in any of the above-mentioned areas declines by 10% or more following the completion of the Merger, falls below any standard prescribed by the Commission or falls below the average as reported by the Commission for Pennsylvania natural gas distribution companies subject to Section 1307(f) of the Public Utility Code, Columbia will meet with any one or more of the Joint Petitioners, upon the request of such Joint Petitioner or Joint Petitioners, to discuss whether a remedy is needed, and if so, what remedy is appropriate and how it should be implemented The Joint Petitioners retain their right to file a complaint in accordance with Commission regulations for any alleged violation of a tariff, regulation, Commission order, or provision of the Public Utility Code. Nothing herein is intended to limit any authority of the Commission, or any of its

bureaus, to perform their duties or make recommendations concerning Columbia's performance in any of the areas enumerated above.

In addition to items (1) through (4) enumerated above, Columbia will keep the following statistics for three years following Merger and will also compare those statistics to its historic experience:

(5) Number of accidental interruptions of service involving more than one thousand (1,000) customers for a duration of more than twelve (12) hours.

(6) Number of fines for violations of environmental, employee health and safety, pipeline safety, or employment laws and regulations.

(7) Number of preventable vehicle accidents.

(8) Number of lost time injuries.

(9) Ratio of meters actually read to those scheduled to be read during a cycle.

(10) Number of overtime hours worked.

(11) Number of incidents of facilities damage due to mismarking of facilities.

(12) Ratio of footage of plastic pipe to total footage of pipe.

(13) Number of service orders worked per service person.

These statistics will be included in the above-referenced annual reports to the Commission. In the event that (a) the statistics described in subparagraphs (5) or (6) increase by more than two (2) for any given year, (b) the statistics described in subparagraphs (7) or (8) increase by more than twenty-five percent (25%), (c) the statistics described in subparagraphs (9) or (12) decrease by more than ten percent (10%), or (d) the statistics described in subparagraph (11) increase by more than ten percent (10%), Columbia will meet with any one or more of the Joint Petitioners, upon the request of such Joint Petitioner or Joint Petitioners, to discuss whether a remedy is needed, and if so, what remedy is appropriate and how it should be implemented. Although Columbia has agreed to report the statistics described in subparagraphs (10) and (13) above, it makes no commitment to hold discussions with respect to those items The Joint Petitioners retain their right to file a complaint in accordance with Commission regulations for any alleged violation of a tariff, regulation, Commission order, or provision of the Public Utility Code. Nothing herein is intended to limit any authority of the Commission, or any of its bureaus, to perform their duties or make recommendations concerning Columbia's performance in any of the areas enumerated above.

27. Columbia agrees that all gas costs savings achieved as a result of the Merger shall be passed through to customers through the Purchased Gas Cost Rider.

28. The consummation and closing of the Merger shall constitute conditions precedent to the Settlement and all obligations of the Joint Petitioners hereunder, and Columbia and the other Joint Petitioners shall not be bound by the terms hereof until such time as the Merger is closed.

29 Following completion of the Merger, the combined company will maintain a presence in PECO Energy Company's electric choice program and Columbia's natural gas choice program, either through an affiliated company or a contractual arrangement with a third party, for a period of at least one year.

III. CONDITIONS OF SETTLEMENT

30. This Settlement is conditioned upon the Commission's approval of the terms and conditions contained herein without modification If the Commission modifies the Settlement, then any Joint Petitioner may elect to withdraw from this Settlement and may proceed with litigation and, in such event, this Settlement shall be void and of no effect Such election to

withdraw must be made in writing, filed with the Secretary of the Commission and served upon all Joint Petitioners within five (5) business days after the entry of an order modifying the Settlement This Settlement is proposed by the Joint Petitioners to settle all issues in the instant proceeding The Settlement is made without any admission against, or prejudice to, any position which any Joint Petitioner to this Settlement may adopt in the event of any subsequent litigation of this proceeding or any other proceeding unless that proceeding involves Columbia to the extent matters resolved by this Settlement are an issue in that Columbia proceeding. If the Commission does not approve the Settlement and the proceedings continue to further hearings, the Joint Petitioners reserve their respective rights to conduct full cross-examination and briefing.

31 The Joint Petitioners agree that this Settlement shall not constitute or be cited as controlling precedent in any other proceeding, including any other proceeding involving a merger or acquisition involving another Pennsylvania public utility, with the exception that the Settlement, if adopted, will bind the Joint Petitioners in any future proceeding involving Columbia to the extent matters resolved by this Settlement are an issue in such proceeding

32 If the ALJ adopts the Settlement without modification, the Joint Petitioners waive their rights to file briefs or exceptions.

33. Statements in Support of the Settlement by Columbia, OCA and OSBA are attached as Appendices "B", "C" and "D" to this Joint Petition

WHEREFORE, the Joint Petitioners, by their respective counsel, respectfully request as follows·

(a) That the Honorable Administrative Law Judge George M Kashi and the Commission approve this Settlement including all terms and conditions thereof

(b) That the Commission issue a certificate of public convenience evidencing approval under Section 1102(a)(3) of the Public Utility Code of the transfer from Columbia Energy Group to NiSource Inc. or New NiSource Inc., by Merger, of the title to and possession and use of all property of Columbia Gas of Pennsylvania, Inc.

Michael W. Gang

Michael W Gang, Esquire
Michael W. Hassell, Esquire
Morgan, Lewis & Bockius LLP

Kenneth W. Christman, Esquire
Columbia Gas of Pennsylvania, Inc

Counsel for Columbia Gas of Pennsylvania, Inc. and NiSource Inc.

Charles Daniel Shields

Charles Daniel Shields, Esquire
Scott H. DeBroff, Esquire
Office of Trial Staff

Charis M Burak

Charis M Burak, Esquire
Derrick P Williamson, Esquire
McNees, Wallace & Nurick
Counsel for Columbia Industrial Intervenors

Bernard A Ryan, Jr., Esquire
Carol F. Pennington, Esquire
Office of Small Business Advocate

See attached

Scott H Strauss, Esquire
David E. Pomper, Esquire
Jeffrey A. Schwarz, Esquire
David B. Lieb, Esquire
Spiegel & MacDiarmid
Counsel for Union Intervenors

Tanya J. McCloskey

Tanya J. McCloskey, Esquire
Stephen J. Keene, Esquire
Office of Consumer Advocate

Dated: June 22, 2000

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Michael W Gang, Esquire
Michael W Hassell, Esquire
Morgan, Lewis & Bockius LLP
Counsel for Columbia Gas of
Pennsylvania, Inc
NiSource Inc

Charles Daniel Shields, Esquire
Scott H. DeBroff, Esquire
Office of Trial Staff

Charis M. Burak, Esquire
Derrick P Williamson, Esquire
McNees, Wallace & Nurick
Counsel for Columbia Industrial
Intervenors

Bernard A Ryan, Jr., Esquire
Carol F Pennington, Esquire
Office of Small Business Advocate

Scott H Strauss, Esquire
David E. Pomper, Esquire
Jeffrey A Schwarz, Esquire
David B Lieb, Esquire
Spiegel & MacDiarmid
Counsel for Union Intervenors

Tanya J McCloskey, Esquire
Stephen J Keene, Esquire
Office of Consumer Advocate

Dated June 22, 2000

APPENDIX A

APPENDIX "A"

Application, Testimony and Exhibits to be Supulated into the Record

APPLICATION

Application of Columbia Gas of Pennsylvania, Inc. for a Certificate of Public Convenience Evidencing Approval under Section 1102(a)(3) of the Public Utility Code of the Transfer from Columbia Energy Group to NiSource Inc. or New NiSource Inc., by Merger, of the Title to and Possession and Use of All Property of Columbia Gas of Pennsylvania, Inc.	March 30, 2000

TESTIMONY

Columbia Statement No 1 – Prepared Direct Testimony of Terrence J Murphy	April 25, 2000
Columbia Statement No. 2 – Prepared Direct Testimony of Mark T. Maassel	April 25, 2000
Columbia Statement No 2-A – Prepared Supplemental Testimony of Mark T Maassel	June 14, 2000
Columbia Statement No 3 – Prepared Direct Testimony of William H. Hieronymus	April 25, 2000
Columbia Statement No 4 – Prepared Direct Testimony of Jamie Welch	May 3, 2000
Testimony and Exhibits of William H Hieronymus (Volume II – Joint Application for Authorization and Approval of Merger Before the Federal Energy Regulatory Commission, Docket No EC00-75-000 – Exhibits APP-1 through APP-30)	April 10, 2000

EXHIBITS

Exhibit MTM-1 – Schematic Representation of NiSource's Corporate Family	April 25, 2000
Exhibit MTM-2 – NiSource Annual Report	April 25, 2000

Exhibit MTM-3 – Schematic Representation of NiSource's Post-Merger Corporate Structure Under Both Preferred and Alternative Structures	April 25, 2000
Exhibit MTM-4 – Agreement and Plan of Merger Dated as of February 27, 2000, As Amended and Restated as of March 31, 2000	June 14, 2000
Exhibit WHH-1 – Resume of William H. Hieronymus	April 25, 2000
Exhibit JW-1 – New NiSource Pro Forma Capitalization	May 3, 2000
Exhibit JW–2 - Cash Flow Statement for Columbia Gas of Pennsylvania, Inc. (CONFIDENTIAL)	May 3, 2000
Exhibit JW-3 – Cash Flow Statement for Columbia Energy Group (CONFIDENTIAL)	May 3, 2000

APPENDIX B

BEFORE
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

In the Matter of the Application of Columbia Gas of Pennsylvania, Inc. for a Certificate of Public Convenience Evidencing Approval under Section 1102(a)(3) of the Public Utility Code of the Transfer from Columbia Energy Group to NiSource Inc. or New NiSource Inc., by Merger, of the Title to and Possession and Use of All Property of Columbia Gas of Pennsylvania, Inc.	: : : : : : : : : :	Docket No. A-120700F0003

Statement in Support of
Joint Petition for Settlement
Submitted by Columbia Gas of Pennsylvania, Inc.
and NiSource Inc.

Columbia Gas of Pennsylvania, Inc. ("Columbia") and NiSource Inc. ("NiSource") (collectively the "Companies") fully support the Joint Petition for Settlement ("Joint Petition") and, by their counsel. submit this Statement in Support of the Joint Petition.

Columbia and NiSource support the Joint Petition for the following reasons:

1. Columbia and NiSource are strong supporters of the use of collaborative processes to develop resolutions of regulatory proceedings. Both Companies believe that the Joint Petition resolves the issues in this proceeding in a manner that is in the interest of all concerned parties while avoiding the time and expense of litigation

2. The Joint Petition will produce an expedited resolution of the proceeding and permit other federal regulatory approval processes to proceed on an expedited basis. Accordingly, the expedited resolution of this proceeding is a substantial inducement to the Companies' support of the Joint Petition.

3. The Joint Petition clarifies procedures to be used by Columbia in recording costs associated with the merger and eliminates issues related to the merger costs which might otherwise arise in future rate proceedings involving Columbia.

4. The Joint Petition protects ratepayers by extending the base rate cap under Section 2211(a) of the Public Utility Code from January 1, 2001 until January 1, 2004, subject to exceptions contained in Section 2211(d) of the Public Utility Code, while providing Columbia with assurances that investigations into base rates will not be initiated during the transition period following the merger.

5. The Joint Petition protects customers by providing for filing of information that will permit the Commission to monitor service quality and provides a procedure to resolve issues concerning service quality if any significant reduction in service quality is perceived. The Companies note, however, that they believe that service quality will be enhanced by the merger and the Joint Petition provides that Columbia will identify best practices and service innovations instituted as a result of the merger.

For the foregoing reasons and those set forth in the Joint Petition, Columbia and NiSource, individually and jointly, strongly support the Settlement contained in the Joint Petition and request the Administrative Law Judge and the Pennsylvania Public Utility Commission to approve it at the earliest possible date

Respectfully submitted,

Michael W Gang

Michael W. Gang, Esquire
Michael W. Hassell, Esquire
Morgan, Lewis & Bockius LLP
One Commerce Square
417 Walnut Street
Harrisburg, PA 17101-1904
Tele: 717-237-4000
Fax: 717-237-4004

Kenneth W. Christman
General Counsel
Columbia Gas of Pennsylvania, Inc.
650 Washington Road
Pittsburgh, PA 15228
Tele: 412-572-7159

Counsel for COLUMBIA GAS OF PENNSYLVANIA, INC and NISOURCE INC.

Of Counsel

MORGAN, LEWIS & BOCKIUS LLP

Dated June 22, 2000

APPENDIX C

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

In The Matter Of The Application Of Columbia Gas of Pennsylvania, Inc For A Certificate Of Public Convenience Evidencing Approval Under Section 1102(a)(3) Of The Public Utility Code Of The Transfer From Columbia Energy Group To NiSource Inc. Or New NiSource Inc, By Merger, Of The Title To And Possession And Use Of All Property Of Columbia Gas Of Pennsylvania, Inc.	:	Docket No. A-120700F00003

STATEMENT IN SUPPORT OF THE
SETTLEMENT OF THE
OFFICE OF CONSUMER ADVOCATE

On March 30, 2000, Columbia Gas of Pennsylvania, Inc (Columbia) filed an Application with the Pennsylvania Public Utility Commission (Commission or PUC) Through this Application, Columbia requested Commission approval of a merger transaction between NiSource Inc. (NiSource) and Columbia Energy Group (CEG) by which NiSource will acquire all of the stock of CEG and thus indirectly acquire title to, and possession and use of, all tangible and intangible property of Columbia which is used and useful in the public service

The proposed transaction provides for the combination of NiSource and CEG involving the creation of a new holding company by NiSource. Under the Merger Agreement, two subsidiaries of the new holding company, NiSource Acquisition Corp and

Columbia Acquisition Corp., will acquire the stock of both CEG and NiSource NiSource Acquisition Corp. and Columbia Acquisition Corp will be merged with and into NiSource and CEG respectively NiSource and CEG will each become wholly-owned subsidiaries of New NiSource Columbia will remain a wholly-owned subsidiary of CEG and will continue to be headquartered in Pittsburgh.

On April 27, 2000, the OCA filed a Notice of Intervention and Protest in order to ensure that the restructuring and merger are approved by the Commission only if (1) it is found to be in the public interest; (2) it provides substantial. affirmative benefits to Columbia's ratepayers, (3) it does not adversely affect retail competition in Pennsylvania; and (4) it is in accordance with the Public Utility Code A Petition to Intervene was also filed by the Columbia Industrial Intervenors (CII) on April 27, 2000 The Office of Trial Staff entered its appearance on April 4, 2000 In its Protest. the OCA raised issues regarding ratepayer benefits. quality of service, merger savings, universal service, corporate structure. codes of conduct, continuation of the Commission's jurisdiction, and effects on the competitive market.

Following a Prehearing Conference and the establishment of a procedural schedule in this matter, the parties to the proceeding engaged in settlement negotiations in an attempt to resolve this matter. Following these negotiations, a consensus Settlement Agreement was reached among the parties As set forth below, the OCA supports the Joint Petition for Settlement and submits that this Settlement will bring affirmative benefits to Columbia's ratepayers and the community.

Importantly, as part of the Settlement, Columbia has agreed to extend the rate cap on its non-gas costs as set forth in Section 2211(a) of the Natural Gas Choice and Competition Act through January 1, 2004 Settlement, ¶10. Additionally, the Company has agreed that it will not seek recovery of any costs to close the merger in a future proceeding. Settlement, ¶11 Thus, during this extended rate cap period, the Company will absorb the costs to close the merger and ratepayers will not be required to pay these costs in any future rates. In addition, the Company has agreed that it will not defer costs to achieve the merger savings that are normally expensed As a result, ratepayers will not be burdened by expenses to achieve the merger at the expiration of the rate cap period In addition, for those costs normally capitalized and amortized, such amortizations will begin during the extended rate cap period which will mitigate the burden of such costs, if any, for ratepayers and maximize the benefits for ratepayers. Columbia has also agreed that ratepayers will not be required to pay charges related to the merger from Columbia's service affiliate that are not accounted for in a manner consistent with the settlement.

Columbia also has agreed that it will not claim an acquisition premium in any future rate proceeding and that the accounting treatment of the acquisition premium on the Company's books will not effect the Company's capital structure for ratemaking purposes. Settlement, ¶12

Additionally, any gas cost savings achieved as a result of the merger will be immediately passed through to ratepayers through the Purchased Gas Cost Rider. Settlement, ¶27. Thus, if Columbia is able to achieve savings in its gas costs, these will immediately benefit ratepayers.

The Company has also agreed that it will seek to improve customer service following the completion of the merger. Settlement, ¶26 The Company will also report on the introduction of service innovations that are anticipated to result from the merger. The Company has agreed to report on its efforts in this regard, including its performance in areas of customer call center availability, meter reading, compliance with Commission requirements, emergency response times, service interruptions and worker safety, and to work with the parties if the Company's service quality experiences a decline following the merger or fails to exceed the average for other NGDC's of similar size. Settlement, ¶26.

Another important feature of the Settlement are the provisions addressing various corporate protections Settlement, ¶¶13, 20, 22. These protections are designed to ensure that Columbia's distribution ratepayers are protected from the risks associated with any diversified businesses and to avoid cross-subsidization of other affiliates. In addition, the agreements ensure the Commission's continuing jurisdiction and the Commission's access to the books, records and personnel necessary to the Commission's regulatory oversight responsibility.

Through this Settlement. Columbia has also reaffirmed its commitment to the expansion of its universal service programs in accordance with the settlements arising from Columbia's restructuring proceedings. Settlement, ¶18. These prior settlements call for a substantial expansion of Columbia's universal service programs. Columbia's commitment here ensures that the merger will not adversely affect the expansion of these programs in a timely manner.

The OCA would also note that the Settlement contains several provisions that should assist in the development of competition in Columbia's service territory First, Columbia has agreed to work with the OCA to develop a shopping guide for residential customer use in its service territory. Settlement, ¶23. This shopping guide is intended to provide necessary and valuable information to residential customers so that customers can make an informed choice regarding the supplier of their natural gas supply. Second, the Settlement ensures that Columbia's Code of Conduct applies to all affiliated companies, including direct and indirect subsidiaries of NiSource. Settlement, ¶21. With this provision, there will be no uncertainty as to the applicability of the Code of Conduct as the Companies combine their operations. Third, the Company has agreed that for a period of at least one year after the merger, the combined company will continue to participate in the electric choice program of PECO and the natural gas choice program of Columbia in which Columbia's current retail marketing affiliate is a participant. This will ensure that in the initial year after the merger, participation in these programs by these retail marketing affiliates continues Settlement, ¶29.

In a related and important feature of the Settlement, the Settlement calls for Columbia to file tariff supplements for all customer classes designed to encourage distributed generation and to conduct a distributed generation demonstration project for a residential customer and a small commercial customer in Columbia's service territory Settlement, ¶15. As Columbia set forth in its direct testimony in support of the Merger, one product offering that will impact both the electric and natural gas competitive markets will be the introduction of distributed generation Columbia St. 2 at 23. Through this Settlement and Merger, Columbia will forward the progress toward the introduction of this important product.

Finally, the Joint Settlement secures Columbia's commitment to maintain its corporate presence in Pittsburgh for an extended period of time, and secures Columbia's commitment to maintain its charitable and community giving following the merger. Settlement, ¶17, 24. The Settlement also provides for Columbia to maintain an organization and staffing plan which provides for adequate, efficient staffing of the utility business and protects against the loss of talent from the regulated operations as more opportunities become available in the merged company. Settlement, ¶17. These provisions are beneficial to the community by securing Columbia's commitment to remain within the community and they ensure that the regulated operations will be appropriately staffed.

Given the range of benefits provided by this Settlement, and the protections afforded to ratepayers, the OCA submits that the Settlement provides substantial affirmative benefits to ratepayers and is in the public interest. The OCA supports the adoption of this Settlement.

Respectfully submitted,

Tanya J. McCloskey

Tanya J. McCloskey
Senior Assistant Consumer Advocate

Counsel for:
Irwin A. Popowsky
Consumer Advocate

Office of Consumer Advocate
555 Walnut Street 5th Floor, Forum Place
Harrisburg, PA 17101-1923
(717) 783-5048

Dated: June 22. 2000
58876

APPENDIX D

APPENDIX D

OFFICE OF SMALL BUSINESS ADVOCATE STATEMENT OF SUPPORT REGARDING A JOINT PETITION FOR SETTLEMENT

Application of Columbia Gas of Pennsylvania For a Certificate of Public Convenience Evidencing Approval under Section 1102(a)(3) of the Public Utility Code of the Transfer from Columbia Energy Group to NiSource Inc. or New NiSource Inc. By Merger, of the Title to and the Possession and Use of All Property of Columbia Gas of Pennsylvania, Inc.
Docket No. A-120700F0003

The Office of Small Business Advocate ("OSBA"), one of the signatories to the Joint Petition for Settlement ("Joint Petition"), submits this statement of support regarding the Joint Petition and requests approval of the Joint Petition by the presiding Administrative Law Judge and the Commission.

Introduction

On March 30, 2000, Columbia Gas of Pennsylvania ("Columbia" or "Applicant") submitted a filing to the Pennsylvania Public Utility Commission ("Commission") requesting the approval of transfer of the assets of Columbia pursuant to the merger of the Columbia Energy Group with NiSource, Inc. The Columbia Energy Group is a public utility holding company and the parent company of Columbia, the Applicant NiSource is an energy and utility-based holding company currently organized under the laws of the state of Indiana. The matter was docketed at A-120700F0003 and assigned to Administrative Law Judge George M Kashi..

Testimony in this case was submitted by Columbia as part of its filing The other parties to this case are the Office of Trial Staff ("OTS"), the Office of Small Business

Advocate ("OSBA") and the Office of Consumer Advocate ("OCA"), the Columbia industrial intervenors ("CII"), the United Steelworkers of America ("Steelworkers"), the Utility Workers Union of America ("UWUA"), the Paper, Allied-Industrial, Chemical and Energy Workers International Union ("PACE"), the Pennsylvania Local of the Steelworkers and UWUA, and NiSource, Inc. Numerous settlement discussions held by the parties resolved the various concerns of the parties. As a result of these collaborative efforts, a settlement in principle was reached which resolves all issues in the case. The Joint Petition for Settlement to which this supporting statement is attached now sets forth the terms and conditions of that settlement agreement

The Settlement and the Public Interest

The OSBA is a party to the Joint Petition for Settlement that the other active parties have also agreed to endorse. The Settlement is in the public interest for the following reasons, among others

1. Columbia has agreed not to increase base rates prior to January 1, 2004 This gives a substantial amount of rate stability to all of Columbia's customers

2. Columbia has agreed not to seek recovery, in any future rate proceeding, of the costs incurred to close the merger. This also insulates Columbia's customers from some future costs

3. Columbia will be filing a tariff which will be designed to encourage the use of distributed generation for residential, commercial and industrial customers who do not qualify for service under Rate CDS - Cogeneration Distribution Service.

NiSource and Columbia have also agreed to conduct a distributed generation demonstration project at one residential and one commercial location in Columbia's service territory. This will encourage the use of new technology by smaller customers.

All of the above conditions will result in greater benefits for smaller users. This will benefit all customers including Columbia's small business customers

Conclusion

For the reasons stated herein, and the reasons stated in the Joint Petition itself, the Office of Small Business Advocate believes that the adoption of the Settlement is in the public interest, and specifically in the interest of the small business customers of Columbia Gas of Pennsylvania, Inc The OSBA asks that the presiding Administrative Law Judge recommend and the Commission adopt the Joint Petition for Settlement as the ultimate resolution of all concerns and issues raised in this proceeding

Respectfully submitted,

Carol F. Pennington
Assistant Small Business Advocate

Dated. June 22, 2000

CERTIFICATE OF SERVICE

I hereby certify that I have this date served a true copy of the foregoing Joint Petition for Settlement upon parties of record in this proceeding in accordance with the requirements of 52 Pa Code §1 54 (relating to service by a participant), in the manner and upon the persons listed below:

VIA HAND DELIVERY

Charles Daniel Shields, Esquire
Scott H DeBroff, Esquire
Office of Trial Staff
Pa. Public Utility Commission
Pitnick Building
901 North 7th Street, Read
P. O. Box 3265
Harrisburg, PA 17105-3265

Tanya J McCloskey, Esquire
Stephen J. Keene, Esquire
Office of Consumer Advocate
5th Floor, Forum Place
555 Walnut Street
Harrisburg, PA 17101-1923

Charis M. Burak, Esquire
Derrick P. Williamson, Esquire
McNees, Wallace & Nurick
100 Pine Street
Harrisburg, PA 17108-1166

Carol F. Pennington, Esquire
Bernard A Ryan, Jr., Esquire
Office of Small Business Advocate
Suite 1102, Commerce Building
300 North Second Street
Harrisburg, PA 17101

Paul J. Metro
Office of Trial Staff
Pa. Public Utility Commission
Pitnick Building
901 North 7th Street, Read
P. O. Box 3265
Harrisburg, PA 17105-3265

Kevan L. Deardorff
Office of Trial Staff
Pa. Public Utility Commission
Pitnick Building
901 North 7th Street, Read
P. O Box 3265
Harrisburg, PA 17105-3265

Honorable George M. Kashi
Administrative Law Judge
Pennsylvania Public Utility Commission
Room G-08, North Office Building
P. O. Box 3265
Harrisburg, PA 17105-3265

VIA FEDERAL EXPRESS

Matthew I. Kahal
Jerome D. Mierzwa
Exeter Associates, Inc.
12510 Prosperity Drive, Suite 350
Silver Spring, MD, 20904

John L. Munsch, Esquire
Allegheny Power
800 Cabin Hill Drive
Greensburg, PA 15601-1689

Stanford L. Levin, Ph.D.
Southern Illinois University at Edwardsville
Room 3130, Building III
Edwarsville, IL 62026-1102

Brian Kalcic
Excel Consulting
225 S. Meramec Avenue, Suite 720-T
St. Louis, MO 63105

Scott H. Strauss, Esquire
David E. Pomper, Esquire
Jeffrey A. Schwarz, Esquire
David B. Lieb, Esquire
Spiegel & MacDiarmid
Suite 1100
1350 New York Avenue N.W.
Washington, DC 20005-4789

Michael W. Gang

Dated: June 22, 2000

1-HA/87466 1

Pennsylvania Gas Association
800 NORTH THIRD STREET, HARRISBURG, PA 17102-2025 (717) 233-5814 FAX (717) 233-7946

DATE: June 16, 2000

TO: Regulatory Matters Committee (VIA FIRST CLASS MAIL)

FROM: Dan Regan, President Dan Regan

RE: PUC Docket No. P-00991738: Petition of Pennsylvania Gas Association for Promulgation of Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies

By e-mail sent earlier today, I reported the Commission's June 8th Order rejecting PGA's Petition concerning cost recovery for research and development expenses. Consistent with that e-mail, a copy of the Order is included for circulation within your companies as appropriate.

Please advise if I can be of further assistance in this matter.

DR:wd

Enclosure

cc: Ms. Tina Thomas, GRI (w/enc.)

PENNSYLVANIA
PUBLIC UTILITY COMMISSION

Public Meeting Held June 8, 2000

Commissioners Present:

John M. Quain, Chairman
Robert K. Bloom, Vice Chairman
Nora Mead Brownell
Aaron Wilson, Jr.
Terrance J. Fitzpatrick

Petition of Pennsylvania Gas Association
for Promulgation of Policy Statement
Regarding Collection of Research and Development
Funds by Natural Gas Distribution Companies

Docket No.
P-00991738

ORDER

BY THE COMMISSION:

A. Introduction

Before us is the Petition of the Pennsylvania Gas Association (PGA) seeking the promulgation of a policy statement which will provide for the collection of funds from natural gas distribution company (NGDC) customers for research and development (R&D) through a surcharge mechanism. We are not convinced that allowing R&D costs to be recovered outside the Section 1308 ratemaking process is appropriate. Further, we are not persuaded that an NGDC can fairly recover its just and reasonable R&D costs only through the use of a surcharge mechanism. For the reasons discussed below, we are denying the Petition.

B. Procedural History

On August 20, 1999 the PGA filed its Petition with the Commission pursuant to section 5.43 of our Rules of Administrative Practice and Procedure. 52 Pa. Code § 5.43. The Petition sought the issuance of a PUC policy statement which would authorize the collection of R&D funds from customers through a surcharge mechanism. In support of its Petition, the PGA stated that surcharges to support research and development are being phased out of interstate pipeline rates as the result of a settlement approved by the Federal Regulatory Energy Commission. Substantial benefits may be realized through continued research and development, according to the PGA. It proposed that continued research and development be funded through a volumetric surcharge imposed at the state level under section 1307(a) (66 Pa. C.S. § 1307(a)) of the Public Utility Code on non--competitive sales and transportation customers. The Petition is described in greater detail below.

On September 16, 1999, the Secretary issued a letter which gave notice of the Petition and invited the filing of answers and replies following publication of a notice in the Pennsylvania Bulletin. The notice was published in the Pennsylvania Bulletin on September 25, 1999. 29 Pa.B. 5037. Answers to the Petition were filed by the Industrial Energy Consumer of Pennsylvania (IECPA), the PUC's Office of Trial Staff (OTS), the Office of the Small Business Advocate (OSBA) and the Office of Consumer Advocate (OCA). Replies were filed by the PGA and Columbia Gas of Pennsylvania, Inc. (CPA). In a letter dated February 4, 2000, the

PGA served copies of a number of decisions of regulatory agencies in other states dealing with this same issue on the Commission staff and the parties which had filed answers.[1]

C. The Petition

In the Petition and the letter which accompanied it, the PGA stresses that "natural gas R&D remains as valuable as ever." The research conducted through the Gas Research Institute (GRI) and the Institute of Gas Technology (IGT) provides substantial benefits. Petition, p. 2. At a minimum, funding for this research should be maintained at current levels, according to the PGA.

R&D funding for these institutions has traditionally been provided through surcharges on rates charged by interstate natural gas pipelines as regulated by the Federal Energy Regulatory Commission (FERC). The PGA points out that, in 1998, FERC approved a settlement among the GRI, the regulated pipelines and their customers which calls for the phase-out of the surcharge to support the GRI over six years. Natural gas distribution companies have paid these surcharges through the rates charged by the pipelines and have recovered the cost of the surcharge through the operation of the fuel cost recovery provision of the Public Utility Code (66 Pa. C.S. § 1307(e) and (f)) as a recognized cost of gas, the PGA states.

PGA argues that, given the methods previously approved for recovering R&D costs, the best way to maintain funding at the pre-phase-out level is to assess

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1 A copy of the letter and attachments was filed in this docket on May 22, 2000.

a volumetric surcharge on non-competitive sales and transportation customers through the automatic adjustment clauses under 66 Pa. C.S. § 1307(a) (Sliding scale of rates; adjustments, General rule). To that end, the PGA has proposed a statement of policy which it recommends that we adopt. Petition, Appendix A.

Titled "Collection of Research and Development Funds," the proposed policy states that:

- For many years R&D costs have been funded through pipeline surcharges which the Commission has permitted NGDCs to recover through their fuel cost recover mechanisms under 66 Pa. C.S. §§ 1307(e) or (f);
- In January 1998,[2] FERC approved a settlement which will phase out the surcharge and eliminate it entirely in 2005. As the surcharge is phased out, there will be an increasing shortfall in R&D funding;
- The PUC concludes that natural gas-related R&D remains of value and should be funded through a Commission authorized mechanism;
- The Commission will permit NGDCs the opportunity to collect R&D expenses through a volumetric surcharge assess on non-competitive sales and transportation customers under 66 Pa. C.S. § 1307(a); and
- Natural gas distribution companies may recover shortfalls for the period prior to January 1, 2001 through filings under 66 Pa. C.S. §§ 1307(e) or (f), or by deferring such costs for full recovery through 66 Pa. C.S. § 1307(a) after January 1, 2001.

Finally, it should be noted that the details of the funding mechanism would be derived on a company by company basis.

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[2] The PGA is incorrect with respect to this date. In January 1998, the settlement judge issued a second report to the FERC. The settlement was certified to FERC on March 10, 1998 and it approved the settlement on April 29, 1998. See Gas Research Institute, Docket Nos. RP97-149-003, et al., and Research, Development and Demonstration Funding, Docket No. RM97-3-001 (Not Consolidated), Order Approving Settlement, 83 FERC ¶ 61,093 (1998) (FERC Order).

D. Positions of the Parities

OCA, OSBA, OTS and the IECPA filed answers opposing the PGA proposed policy statement. OCA, OSBA and OTS do not dispute the importance or potential benefit from the R&D projects undertaken by GRI, but they argue that there is no reason to treat natural gas R&D differently than other costs recovered through base rates. OCA states that the Commission has viewed a surcharges as a "temporary measure to meet unusual circumstances and not as a permanent, and continually increasing, element." OCA Answer, pp. 2-3; quoting Re Fuel Surcharge for Motor and Rail Common Carriers, 54 Pa. P.U.C. 272, 273 (1980). To allow the gas industry to recover R&D funding through a guaranteed cost recovery mechanism gives it an advantage over other segments of the energy industry which do not have such guaranteed cost recovery mechanisms in place, OCA argues. It notes that there is no such guaranteed surcharge for the electric industry. Id. The electric industry employs a voluntary program in which costs are recovered from customers through base rates. This should be the model followed for the gas industry, according to OCA.

OCA argues that surcharges are designed to recover large and fluctuating expenses or unusual costs, not on-going costs like R&D. Moreover, OCA points out that automatic surcharges provide a disincentive to control costs. OCA Answer, p. 5.

OCA states that we should follow FERC's lead on this matter. It is eliminating mandatory payments for R&D through a surcharge and going to a purely voluntary system. OCA Answer, p. 4. Additionally, the mechanism proposed by the PGA is unduly discriminatory in that the proposed surcharge would be borne only by non-competitive customers. OCA Answer, pp. 6-7. OSBA makes a similar point, stating that competitive sales and transportation customers should bear "their fair share of those [R&D] costs." OSBA Answer, p. 3. The entire burden of R&D should not be placed upon the non-competitive customers.[3] Id.

The OTS states that historically, the R&D costs charged to NGDC customers had two components. The first were the costs paid by NGDCs directly for R&D. These expenses were included in the NGDC's base rates following a prudence review. OTS Answer, p. 3. The second component were those costs paid directly by pipelines which were recovered through the pipelines' rates. The exact amount of these costs could not be ascertained and, therefore, they could not be reconciled. OTS states that R&D expense above each NGDC's historical incremental cost be deferred until the distribution company's next base rate case. OTS Answer, p. 4.

IECPA opposes any mandatory recovery of R&D costs from ratepayers. It argues that the need for R&D has lessened due to passage of the Natural Gas Choice and Competition Act and that most R&D is directed at increasing consumption or supply of gas. IECPA contends that the burden of funding R&D

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[3] OSBA says it could accept a non-bypassable distribution charge or licensing fee arrangement, but has no plan to offer itself. OSBA Answer, p. 3.

is shifting to the natural gas suppliers (NGSs) and away from companies whose main job is to distribute gas. IECPA Answer, pp. 1-2. It states that the bulk of the surcharge will go to increasing the share of natural gas in the market over other forms of energy which do not have funding from captive ratepayers. It further argues that the PGA should have proposed a method of designating where R&D funds will be spent, but it did not. IECPA also points out that most of the projects referenced in the materials provided by the PGA with its Petition are directed at residential customers while products which would benefit large industrial customers are being developed with private funds. Thus, it claims that charging large industrial customers for R&D would be inappropriate. IECPA Answer, p. 3.

The PGA filed a reply to these answers. First, it notes that the representatives of the customers who would pay the surcharge, OCA and OSBA, recognize the value of R&D and that OTS, while opposing the surcharge, does not favor removing recovery of R&D costs from rates. Only IECPA questions the benefits of R&D, PGA states. PGA Reply, pp. 1-2. It points out that since only non-competitive customers will pay the surcharge, the IECPA's industrial membership will not be subject to this cost. CPA, which also filed a reply, responds to IECPA by pointing to the benefits which continue to come from R&D. CPA states that "competition will breed innovation, and innovation will ultimately benefit consumers with enhanced service options." CPA Answer, p. 2. NGDCs, therefore, must be able to fully fund continuing R&D.

The PGA responds to the opposition to the use of a volumetric surcharge by OCA, OSBA and OTS by stating that this method will ensure funding of GRI research at levels consistent with those prior to the phase-out by FERC. Recovering these costs through base rates would be inappropriate because it is not possible to make sure all R&D costs are recovered, particularly in instances of "black box" settlements. If R&D funding is inhibited, the resulting benefits of the research will suffer. Therefore, the PGA argues that a surcharge is the most appropriate means of recovering these costs.

E. **Discussion**

Before discussing the other issues surrounding the Petition, we believe it is necessary to answer a point made by ~~IECPA with regard~~ to the value of R&D. We believe the PGA correctly points out the continuing benefits of R&D for the natural gas industry. Although we do have problems with the proposal ~~made by~~ the PGA, we are not ready to state that all R&D funding should be made by private sources. The PGA and CPA are correct in asserting that innovation through research and development are an essential part of the introduction of competition into the sale of natural gas and other areas of the industry. The difficulty here lies with the proposed funding mechanism.

In its Petition and the attached GRI materials, the PGA highlights the benefits that have accrued to all parts of the industry through R&D projects. These benefits are impressive. However, although they have wide application, the PGA would have the non-competitive captive customers assume the full burden of paying for these research and development projects. We are in agreement with OCA and OSBA that placing this burden on captive customers who have no other choice is both unfair and inappropriate. If the benefits are shared by all customers, the costs should be borne by all who benefit from the R&D.

This rationale appears to be consistent with FERC's view of R&D funding. For example, FERC did not simply end contributions to GRI. In approving the settlement, FERC approved a system whereby:

> On and after the earlier of January 1, 2005, or the day after the date of GRI's notice as described herein, GRI membership and GRI funding will be on a purely voluntary basis."

FERC Order, mimeo at 7; (emphasis supplied). While we are not bound by FERC's decision with regard to our consideration of the Petition, we are persuaded that forcing non-competitive residential and small commercial customers to pay all GRI R&D costs is inimical to the spirit of the FERC Order. Further, we will not sanction the increase of R&D payments by Pennsylvania captive ratepayers to make up shortfalls caused by the failure of interstate natural gas pipelines to fund this research through voluntary contributions.

Moreover, we also agree that funding through base rates will enable us to examine the nature of the proposed research and the potential benefits. Natural gas suppliers should privately fund research that will benefit their gas sales and other services. Given the changing structure of the natural gas industry in Pennsylvania in the wake of the Natural Gas Choice and Competition Act, blanket support of research by NGDC customers alone is no longer appropriate. Although we expect that R&D funding by NGDC customers will continue, we cannot support the creation of a mechanism which guarantees full recovery of R&D expenses[4] while limiting our ability to review these costs in the context of a rate case under section 1308 of the Public Utility Code. 66 Pa. C.S. § 1308.

We must also add that we do not find the documents submitted by the PGA to be persuasive. One is a letter from an official of the Kentucky Public Service Commission to the GRI. As such, it is not a commission order and is not properly included within our review. The other two documents are orders of the Wyoming Public Service Commission and the Idaho Public Utilities Commission concerning natural gas distribution companies within their jurisdictions. Neither state has implemented retail choice for all gas customers and, therefore, their decisions are made in regulatory settings which are inapplicable to our own with regard to this issue. Questar Gas Company in Wyoming, the subject of the Wy. PSC order, has permission to offer its customers retail choice, but this program is still in its formative stages.

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[4] We note that the PGA has not made a case that R&D expense is so different from any other operating expense that it must be given separate treatment through the imposition of a surcharge.

Conclusion

For all of the above reasons, the Petition of the PGA is hereby denied;

THEREFORE, IT IS ORDERED:

1. That the Petition of the Pennsylvania Gas Association that the Commission issue a policy statement with respect to the funding of research and development costs through a surcharge pursuant to 66 Pa. C.S. § 1307(a) is hereby denied.

2. That a copy of this Order and any accompanying statements of the Commissioners be served upon the Pennsylvania Gas Association and all parties which submitted answers or replies.

3. That a copy of this Order shall be posted on the Commission's web site and shall be made available, upon request, to all other interested parties.

4. That this docket be marked closed.

BY THE COMMISSION,

James J. McNulty

James J. McNulty
Secretary

(SEAL)

Order Adopted: June 8, 2000

Order Entered: JUN -8 2000

Pennsylvania Gas Association

800 NORTH THIRD STREET, HARRISBURG, PA 17102-2025 (717) 233-5814 FAX (717) 233-7946

SECRETARY'S BUREAU
PA.P.U.C.
99 AUG 20 PM 12:50

August 20, 1999

Mr. James J. McNulty
Secretary
Pa. Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105

Re: PUC Docket No P-__________ Petition for Promulgation of Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies

Dear Mr. McNulty:

Enclosed, for filing with the Commission, are the original and three copies of a petition urging the Commission to promulgate a policy statement addressing natural gas distribution companies' future collection of research and development funds.

As contemplated by the Service of Documents rule at 52 Pa. Code § 1.51, the Pennsylvania Gas Association will await further instructions from your office regarding service or notice of the enclosed petition. Concurrent with this filing, courtesy copies of the petition and a transmittal letter (attached) are being delivered by hand to each of the Commissioners

Respectfully submitted,

Dan Tunnell

Daniel R. Tunnell
President

Enclosures

cc: Hon John M. Quain (w/ encs.)
Hon Robert K. Bloom (w/ encs)
Hon Nora Mead Brownell (w/ encs)
Hon David W. Rolka (w/ encs.)
Hon Aaron Wilson, Jr. (w/ encs)

Pennsylvania Gas Association

800 NORTH THIRD STREET, HARRISBURG, PA 17102-2025 (717) 233-5814 FAX (717) 233-7946

August 20, 1999

The Honorable John M Quain, Chairman
Pennsylvania Public Utility Commission
P.O Box 3265
Harrisburg, PA 17105-3265

Re: PUC Docket No P-______________ Petition for Promulgation of Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies

Dear Chairman Quain:

Natural gas research and development is currently funded in part through surcharges which Pennsylvania local distribution companies and others pay to interstate natural gas pipelines under rate schedules approved by the Federal Energy Regulatory Commission. In 1998, these surcharges equated to 1 74¢ per Dekatherm for Pennsylvania LDCs The Commission has treated these surcharges as natural gas costs, which LDCs have recovered pursuant to Section 1307(e) or (f) as applicable

In January 1998 FERC approved a settlement which will phase out these surcharges over six years and eliminate them altogether beginning 2005. As a result, the Pennsylvania LDCs' 1999 surcharge equates to 1.51¢ per Dth, 0.23¢ less than last year.

Although the federal surcharges are being phased away, natural gas R&D remains as valuable as ever Therefore, if Pennsylvania's LDCs are to maintain or surpass their historic levels of commitment, a new R&D funding mechanism will need to be created and implemented. Through the enclosed petition, the Pennsylvania Gas Association urges the Commission to adopt a policy statement endorsing the collection of R&D funds through volumetric surcharges on non-competitive sales and transportation services The LDC's surcharges, which would be established through individual tariff filings, would offset the funding shortfall caused by the phased elimination of the federal surcharge LDC surcharges would be implemented through automatic adjustment clauses approved by the Commission in accordance with Section 1307(a) of the Public Utility Code, with existing audit, investigation and rate procedures available to ensure that funds collected through an R&D surcharge are used for R&D

PGA respectfully requests this petition be given expeditious consideration given the wave of activity that is already being felt by the natural gas community as it begins to implement the natural gas restructuring legislation Please feel free to contact me if I can offer additional information or assistance

Sincerely,

Dan Tunnell

Daniel R. Tunnell
President

Enclosures

cc: Hon. Robert K. Bloom (w/ encs)
Hon. Nora Mead Brownell (w/ encs.)
Hon. David W Rolka (w/ encs)
Hon. Aaron Wilson, Jr. (w/ encs.)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition for Promulgation of Policy Statement Regarding Collection of Research and Development Funds by Natural Gas Distribution Companies	))))	Docket No P–____________

PETITION

Pursuant to Section 5 43 of the Commission's Rules of Administrative Practice and Procedure,[1] the Pennsylvania Gas Association ("PGA") petitions the Commission to promulgate a policy statement, substantially similar in context to that provided in Appendix "A," endorsing the collection of certain research and development ("R&D") funds through an automatic adjustment clause approved by the Commission pursuant to Section 1307(a) of the Public Utility Code.[2] In support of this Petition, PGA states as follows:

1 For many years, natural gas R&D has been funded, in part, through surcharges assessed by interstate natural gas companies on Pennsylvania LDCs and others at rates regulated by the Federal Energy Regulatory Commission ("FERC"). The Commission has treated these interstate pipeline surcharges as a cost of natural gas, and allowed Pennsylvania's LDCs to recover them through purchased gas cost ("PGC") rates set pursuant to Section 1307(e) or (f) of the Public Utility Code [3]

2. In January 1998, FERC approved a settlement which will phase out the federal R&D surcharges over six years, and eliminate them altogether beginning 2005 In 1998, the surcharges paid by Pennsylvania LDCs equated to 1 74¢ per Dekatherm

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1 52 Pa. Code § 5 43

2 66 Pa.C.S. § 1307(a).

3 66 Pa.C S § 1307(e)-(f)

("Dth"). In 1999, the first year of the phase-out, the figure fell 0.23¢ to 1.51¢ per Dth. As the phase-out progresses, the federal surcharges will continue to shrink, creating an increasing shortfall in R&D funding relative to 1998 pre-settlement levels

3. Although the federal surcharges are being phased away, the underlying value of natural gas R&D remains significant for natural gas consumers In Appendix "B" to this Petition, the Gas Research Institute ("GRI") describes various natural gas R&D projects under its supervision and the benefits these projects have provided to consumers. Appendix "C" to this Petition provides similar information for projects conducted by the Institute of Gas Technology ("IGT")[4] The GRI and IGT materials demonstrate the substantial benefits that have been realized to date through natural gas R&D, and underscore the need to identify and implement a mechanism that at least can sustain R&D funding at present levels

4. Considering the methods previously approved for R&D funding, and the competitive realities facing Pennsylvania's natural gas utilities both today and in the future, the best mechanism for maintaining R&D expenditures at the pre-phase-out level[5] would be through a volumetric surcharge to be assessed to non-competitive sales and transportation customers pursuant to automatic adjustment clauses which individual utilities would file under Section 1307(a) of the Public Utility Code.[6] A volumetric mechanism would be

---

4 Because GRI and IGT particpate in some joint projects, the items identified in Appendices "B" and "C" may overlap

5 Although the need for this policy statement arises because of the R&D funding shortfall at the federal level, the collection mechanisms described in this petition need not be limited to merely maintaining R&D funding at 1998 settlement levels. At a utility's request, the Commission may well wish to authorize funding levels that would permit even greater investment in natural gas R&D

6 66 PA.C.S. § 1307(a).

consistent with current Pennsylvania practice, since Pennsylvania LDCs have traditionally reflected the federal R&D surcharges through volumetric PGC rates In addition, a volumetric mechanism would be similar to the Commission-approved mechanism for LDC recovery of FERC Order No. 636 transition costs By applying the charge to non-competitive sales and transportation services, the mechanism would give appropriate recognition to the competitive situation faced by Pennsylvania's LDC's, while maintaining basic similarity between those who will pay the LDC surcharges and those who historically paid the federal surcharges

5 The methodology for determining the level of each utility's surcharge should be left to the individual filings For example, one utility may wish to commit itself to a specific level of R&D expenditures, to set its surcharge in anticipation of collecting the specified amount, and to employ a reconciliation mechanism to address over or under collections Another utility may wish to commit itself to spend whatever level of R&D funds are collected through its surcharge, thus eliminating any need for reconciliation Both approaches are equally valid, and the Commission can adopt a policy favoring R&D surcharges without prejudging issues of ratemaking methodology.

6 A separate mechanism will be necessary for situations where an R&D surcharge via Section 1307(a) would be unavailable. Two alternatives are possible First, the Commission could declare that shortfalls resulting from the federal surcharge phase-out can be recovered through PGC rates for the duration of the rate cap. Second, the Commission could authorize natural gas distribution companies to accrue shortfall payments for full recovery after the rate cap expires

7. The need to address the R&D funding shortfall is immediate, given that the first step of the federal phase-out has already occurred. By promptly issuing a policy statement such as that provided in Appendix "A," the Commission would furnish a platform for LDCs to develop their individual filings.

WHEREFORE, in light of the facts and arguments presented above, the Pennsylvania Gas Association urges the Commission to promulgate a policy statement, substantially similar in context to that provided in Attachment "A," endorsing the collection of certain research and development ("R&D") funds through an automatic adjustment clause approved by the Commission pursuant to Section 1307(a) of the Public Utility Code

Respectfully submitted,
PENNSYLVANIA GAS ASSOCIATION

By: Dan Tunnell
DANIEL R. TUNNELL
President

DATED August 20, 1999

APPENDIX "A"

Collection of Research and Development Funds
by Natural Gas Distribution Companies

§ 69.___. Collection of Research and Development Funds

(a) For many years, natural gas research and development has been funded, in part, through volumetric charges assessed by interstate natural gas companies on services provided to Pennsylvania natural gas distribution companies and others at rates regulated by the Federal Energy Regulatory Commission. The Commission has treated these interstate pipeline surcharges as a cost of natural gas and allowed Pennsylvania natural gas distribution companies to recover them through purchased gas cost rates set pursuant to 66 Pa.C S § 1307(e) or § 1307(f).

(b) In January 1998, the Federal Energy Regulatory Commission approved a settlement which will phase out this surcharge over six years and eliminate it altogether in 2005 As the phase-out progresses, the size of the surcharge will continue to shrink, creating an increasing shortfall in this aspect of research and development funding relative to the 1998 pre-settlement level.

(c) Although the surcharge is being phased away, the Commission concludes that the underlying value of natural gas research and development remains significant for Pennsylvania and its natural gas consumers. The Commission further concludes that a mechanism must be implemented to allow Pennsylvania's natural gas distribution companies to collect an amount that is at least equivalent to the shortfall created by the phased elimination of the federal research and development surcharge

(d) The Commission will permit natural gas distribution companies the opportunity to collect a research and development surcharge through the filing of a tariff supplement under 66 Pa.C.S § 1307(a). Rates established through a tariff supplement filed pursuant to this policy statement will take the form of a volumetric surcharge to be assessed to non-competitive sales and transportation customers.

(e) Natural gas distribution companies may recover shortfalls for the period prior to January 1, 2001, either (1) through filings under 66 Pa.C S. § 1307(e) or § 1307(f), as applicable, or (2) through deferring such costs for full recovery after January 1, 2001, through rates established in a tariff supplement filed pursuant to subsection (d) above

APPENDIX B - GRI MATERIAL

GRI-98/0147

Benefits of GRI R&D Results That Have Been Placed in Commercial Use in 1993 Through 1997

Prepared by:

Athanasios D. Bournakis
Energy Resources Center
University of Illinois at Chicago

and

Gerald D. Pine
Gas Research Institute

May 1998

Abstract

This report provides a brief description of the twenty-seven new GRI R&D items introduced in 1997 and quantifies the economic benefits of one hundred and eleven items commercialized between 1993 and 1997 that are known to have produced significant economic benefits for their users. The calculated ratio of the benefits to gas customers to total GRI costs incurred in 1993 through the end of 1997 was 9 to 1.

In a similar analysis carried out in 1997 for ninety-seven R&D items placed in commercial use between 1992 and 1996, the calculated ratio of the benefits to gas customers to total GRI costs incurred during the same period was 7.1 to 1.

Acknowledgments

The authors gratefully acknowledge the significant contribution provided by the following personnel of the Energy Resources Center of the University of Illinois at Chicago: Irene D. Banas for evaluating the benefits of GRI's Supply and Environment and Safety R&D; Dr. Paul L. Brillhart on his analysis of the Basic Research, Industrial, and Power Generation R&D benefits; David A. Eslinger on his analysis of the Residential and Natural Gas Vehicles R&D benefits; and Darryl M. Lang on his analysis of the Distribution and Transmission R&D benefits.

Also, we want to thank the GRI personnel for their continued support in the evaluation of benefits from GRI R&D results.

Legal Notice

Introduction

Between January 1, 1997 and December 31, 1997, twenty-seven GRI R&D results were placed in commercial service. In addition, enhanced versions of four previously commercialized items were placed in use. Those items are listed in Table 1, and brief descriptions of the 31 items are included in Appendix A. With these new additions, some 165 GRI R&D results have entered the commercial marketplace during the 5-year period between January 1993 and December 1997. The full list of the 165 items is included in Appendix B. As one measure of the value of the GRI R&D program, the economic benefits accruing to users of 111 out of the 165 products can be compared to the total outlays of GRI during the past five years. This paper highlights the new GRI products that have entered the market during the past year and presents the results of the benefit-to-cost analysis of GRI's R&D results during the past five years.

Notable additions to the list of GRI R&D results placed in commercial service in 1997 are the introduction of a new residential water heater for outdoor installation; the introduction of a new engine-driven chiller with a footprint equivalent to the electric competition; a new gas refrigeration system; equipment and software that improve refueling for natural gas vehicles; the application of low emission combustion systems for power generation; a new system that can significantly cut the cost of determining the effectiveness of cathodic protection systems for steel piping used to transport gas; an innovative, time and money-saving trenchless technology for renewing gas service lines; guidelines for directional drilling used by gas utilities to install polyethylene pipe, information on the potential health risks associated with PCB (polychlorinated biphenyls) releases from pipelines; a research program to develop and evaluate an integrated chemical-biological treatment process capable of enhancing the rate and extent of polynuclear aromatic hydrocarbons; a testing method for identifying important resin failure characteristics in plastic pipe: atlases of natural gas and oil reservoirs for the Appalachian Basin and for deep water drilling in the Gulf of Mexico; a manual about underbalanced drilling; and an improved analysis protocol for determining the reservoir parameters used for calculating the gas-in-place volume of coalbed reservoirs

Table 1. GRI R&D Results That Have Been Placed in Commercial Use in 1997

RESIDENTIAL

1. Outdoor Gas Water Heater (American Water Heater Co.)
2. Advanced Gas Fireplace (Lennox)

COMMERCIAL

3. BinMaker™: The Weather Summary Tool
4. TecoFROST™ Gas Engine Driven Refrigeration
5. York Millennium™ GED, Model YB
6. Pulse-Combustion Hydronic Boiler*

TRANSPORTATION

7. FuelMaker-Quantum Vehicle Refueling Appliance Line
8. AccuFill Dispenser Fill Algorithm
9. NGV-1 Receptacle/Nozzle Standard Design

POWER GENERATION

10. Allison LE IV Dry, Low-Emissions (DLE) Combustor*
11. General Electric LM 1600*

GAS OPERATIONS

12. Orifice Meter Information*
13. Pipeline Current Mapper
14. RENU Service Renewal Technology
15. Pneumatic Tool Diagnostic System (Tool Tester)
16. Horizontal Directional Drilling Guidelines
17. Hydrostatic Test Water Discharge
18. PCB Contaminated Pipeline Abandonment Protocol
19. Low Cost Method for Formaldehyde Measurements
20. Contained Recovery of Oily Waste Technology Evaluation (CROW) Technology for Water Cleanup
21. CBT (Chemical-Biological Treatment) Cleanup Technology
22. Gas Plant Emissions/Efficiency Report
23. Lomic SonicWare™
24. Plastic Pipe Reliability (PENT Test)

SUPPLY

25. Mercury Soil Contamination Program
26. Offshore Atlases - Part 2
27. Appalachian Atlas
28. Underbalanced Drilling Manual
29. Freeze/Thaw for Production Water
30. Glycol Dehydrator Controls/Monitoring
31. Coalbed Reservoir Gas-In-Place Analysis Short Courses

* Enhancement to a previous winner.

Benefits Results

The full list of the 165 items placed in commercial use between January 1993 and December 1997 is included in Appendix B, but we chose to focus the benefits analysis of GRI's R&D on 111 of the 165 items that are known to have produced significant *economic* benefits for their users. The 111 items are listed in Table 2. Benefits to product users in typical applications were calculated by comparing the economics of the GRI-sponsored products with the economics of products that would have been used in the absence of the GRI product. Product cost and performance data were obtained from product vendors, from field test results, or from product users. The measure of product benefit is the net present value of the incremental cash flow to the user (cost savings minus incremental cost) over the product lifetime using a real discount rate of 5% (above inflation). The GRI Baseline [1] national average projections of energy prices were used, when appropriate, to estimate cost savings. Total benefits were calculated by multiplying the unit benefits by the sales projected by product vendors from the first year in which the product was sold through 2002. The results are shown in Table 2. A range of product sales is shown to protect proprietary vendor sales projections.

As shown in Table 2, calculated economic benefits for the 111 items are estimated to be between $7.2 to $14.0 billion. Table 3 shows ~~the~~ expected value of benefits, at about $9.75 billion, and the breakdown of the economic benefits by sector. We estimate that the 111 items account for most of the economic benefits that would be calculated for the entire set of 165 products. Omitted items often offer significant benefits to their users, but have not achieved widespread use as have the 111 high impact items. More importantly, many of the omitted items produce benefits that are not easily quantifiable in economic terms. For example, R&D related to natural gas vehicles has been undertaken primarily to provide a natural gas transportation option that meets existing or anticipated emissions requirements. Other R&D results provide test methods for new gas equipment. Finally, many of the 165 items provide information that is useful to the gas industry in developing the gas resource and in delivering it to the customer.

Table 2. Summary of Benefits of GRI R&D Results That Have Been Placed in Commercial Use in 1993 Through 1997

	Sales or Applications Projected Through 2002 (in units)	Year of First Sale	Net Present Value of Benefits** (Million 1997$)
RESIDENTIAL			
Protocol for Water Heater Emissions Measurement	10,000 to 30,000	1995	$11 to $12
Gas Load Center	2,000 to 4,000	1995	$0.2 to $0.4
Venting Products:	400,000 to 750,000	1995	$169 to $318
• Venting Guidelines for 1996 National Fuel Gas Code			
• Test Protocols for High-Temperature Plastic Vents			
Carrier "Chimney Friendly" Furnace	5,000 to 15,000	1996	$2 to $5
Modulating Furnace by RHEEM	30,000 to 100,000	1996	$0.2 to $1
Empire Gravity Vented Wall Furnace	35,000 to 80,000	1996	$128 to $293
Utility-to-Customer Communication (Whisper)	1,100,000 to 3,500,000	1996	$21 to $66
Outdoor Water Heater	70,000 to 150,000	1997	$8 to $16
COMMERCIAL			
Absorption Chillers (Trane)	500 to 1,000	1993	$261 to $522
Gas Combination Oven/Steamer	750 to 2,000	1994	$47 to $124
Large Gas Engine-Driven System:	270 to 740	1994/95	$69 to $197
• 340RT Large Engine Chiller (Tecogen)			
• 485RT Large Engine Chiller (Tecogen)			
• 725RT Large Engine Chiller (Tecogen)			
• 1000RT Large Engine Chiller (Tecogen)			
• Millennium Engine-Driven Chillers (York)			
Batch Booster Water Heater	2,000 to 5,000	1995	$11 to $27
Restaurant-Sized Steam Combination Oven	1,000 to 3,000	1995	$15 to $46
GATC Quick Response Activities:	2,000 to 4,000	1995	$28 to $55
• Gas Rotisserie Chicken			
Trane Modulating Rooftop Unit	2,000 to 5,000	1996	$8 to $20
Separation Requirements in ASHRAE Standard 62-89R	20,000 to 35,000	1996	$202 to $354
TecoFROST™ Gas Engine Driven Refrigeration	10 to 30	1997	$3 to $8
Pulse Combustion Hydronic Boiler	150 to 400	1996	$0.5 to $1.3
INDUSTRIAL			
DONLEE TurboFire® XL Boiler	12 to 25	1994	$9 to $18
Ion-Nitriding GASFIRED™ Vacuum Furnace	4 to 9	1994	$3 to $7
Process Application of Composite Radiant Tubes	15,000 to 30,000	1994	$27 to $53
Heat Treat Furnaces	10 to 20	1995	$7 to $13
Low NO_x Air Staging for Glass Melting	15 to 30	1995	$139 to $278
Glass Tempering Furnace	20 to 40	1995	$61 to $121
High Performance Infrared Burners	50 to 100	1995	$126 to $253

	Sales or Applications Projected Through 2002 (in units)			Year of First Sale	Net Present Value of Benefits** (Million 1997$)		
Steel Products Heating Furnace	7	to	11	1995	$200	to	$300
Industrial Boiler Gas Cofiring	90	to	200	1995	$47	to	$104
CYCLOMAX® Low NO_x Industrial Burner	200	to	350	1996	$145	to	$253
TRANSPORTATION							
Chrysler Minivan	900	to	1,500	1993	$0.7	to	$1.2
Caterpillar Dual-Fuel Truck Engine	500	to	2,000	1996	$5	to	$19
POWER GENERATION							
Low NO_x Turbine Combustors:	***			1995/97	$456	to	$786
• SoLoNO$_x$™ Gas Turbine Combustor (Solar)							
• Allison 501-K Low NO_x Combustor							
• Low- NO_x Turbine Combustor (GE LM 1600)							
GAS OPERATIONS							
Low NO_x Turbine Combustors:	***			1992/95	$1,199	to	$2,476
• SoLoNO$_x$™ Gas Turbine Combustor (Solar)							
• Dry Low- NO_x Combustor (GE)							
• Allison 501-K Low NO_x Combustor							
Visual Internal Inspection System	800	to	2,000	1993	$14	to	$34
Electrostatic Discharger System	20	to	50	1993	$15	to	$36
Compressor Diagnostic Software	25	to	50	1993	$6	to	$12
ENSYS Rapid Field Test Kit for PCB Soil Contamination	100,000	to	200,000	1993	$7	to	$14
Low-Cost NO_x Controls for Pipeline Engines							
• Low-Cost NO_x Controls for 4-Cycle Ingersoll-Rand Pipeline Engines (Dresser-Rand)	***			1994	$37	to	$65
• Low-Cost NO_x Controls for 2-Cycle CLARK™ Pipeline Engines (Dresser-Rand)	***			1994	$30	to	$45
• Low-Cost NO_x Controls for 2-Cycle GMV Series Pipeline Engines (Cooper Industries)	***			1994	$3	to	$4
Electronic Flow Measurement Device	30,000	to	60,000	1994	$27	to	$53
LIFESPAN PE Program	100	to	200	1994	$61	to	$122
Excess Flow Valves Information	***			1985/94	$69	to	$104
Acoustic Pipe Tracer	250	to	550	1995	$3	to	$7
Relining of Cast Iron and Steel Pipe	7,000	to	15,000	1995	$17	to	$36
Coiled Plastic Pipe Information	***			1995	$16	to	$23
Guidelines for Low-Cost, OSHA-Approved, Shoring Design and Materials	***			1995	$15	to	$41
Plastic Pipe Across Bridges	5,000	to	12,000	1995	$32	to	$76
Soil Compaction Meter	4,000	to	8,000	1995	$3	to	$6
Inspection Vehicle for Unpiggable Lines	20	to	40	1995	$43	to	$86
OMNET Surface/Subsurface Modeling Software	40	to	80	1995	$64	to	$128
Methodology to Estimate Methane Emissions from Gas Operations (STAR Program)	10,000	to	20,000	1995	$37	to	$75

	Sales or Applications Projected Through 2002 (in units)			Year of First Sale	Net Present Value of Benefits** (Million 1997$)		
Anaerobic Cast Iron Joint Repair Guide	50,000	to	120,000	1996	$20	to	$48
Assessment of Gas Pipeline Non-Destructive Evaluation (NDE) Technologies	***			1996	$55	to	$110
Airborne Pipeline Integrity Monitoring (APIM) Assessment	***			1996	$5	to	$11
Pipeline Inspection and Maintenance Optimization System (PIMOS)	***			1996	$11	to	$20
Remote and Automatic Controlled Valves Guidelines	***			1996	$38	to	$82
Risk Assessment/Risk Management Guidelines	***			1996	$80	to	$138
Third-Party Damage Prevention Assessment	***			1996	$20	to	$39
Carbon Monoxide Detector Supplemental Standards	20,000,000	to	40,000,000	1996	$279	to	$557
Manufactured Gas Plant (MGP) Site Management Guidebooks (4 Volume set)	200	to	500	1996	$29	to	$73
Cost Model for MGP Site Cleanups	150	to	300	1996	$17	to	$34
Soil Cofiring in Utility Boilers at MGP Sites	15	to	30	1996	$7	to	$13
Thermal Desorption for Soil Cleanup at MGP Sites	30	to	60	1996	$32	to	$64
Pipeline Current Mapper	2,000	to	4,000	1997	$41	to	$82
RENU Service Renewal Technology	25,000	to	50,000	1997	$23	to	$46
Pneumatic Tool Diagnostic System (Tool Tester)	100	to	200	1997	$18	to	$36
Hydrostatic Test Water Discharge	150	to	350	1997	$20	to	$46
PCB Contaminated Pipeline Abandonment Protocol	600	to	1,300	1997	$28	to	$61
Low Cost Method for Formaldehyde Measurements	1,000	to	3,000	1997	$10	to	$30
Contained Recovery of Oily Waste Technology Evaluation (CROW) Technology for Water Cleanup	20	to	40	1997	$7	to	$6
CBT Cleanup Technology	10	to	25	1997	$10	to	$25
Gas Plant Emissions/Efficiency Report	200	to	400	1997	$5	to	$9
Lomic SonicWare™	600	to	1,300	1997	$23	to	$50
Plastic Pipe Reliability (PENT Test)	400	to	800	1997	$9	to	$18
GAS SUPPLY							
Atlases Of Major Gas Reservoirs:	2,000	to	4,000	1989/97	$71	to	$142
• Atlas of Major Texas Gas Reservoirs				1989			
• Atlas of Major Central and Eastern Gulf Coast Gas Reservoirs				1993			
• Atlas of Major Mid-Continent Gas Reservoirs				1993			
• Atlas of Major Rocky Mountain Gas Reservoirs				1993			
• Appalachian Atlas				1997			
• Offshore Atlas				1997			
Gas Content Correlation for the Antrim Shale	2,000	to	3,000	1993	$255	to	$383

	Sales or Applications Projected Through 2002 (in units)			Year of First Sale	Net Present Value of Benefits** (Million 1997$)		
Amplitude Variation with Offset (AVO)	1,500	to	2,500	1993	$179	to	$299
Quantitative Gas Measurement (QGM)	6,000	to	10,000	1994	$22	to	$36
Wireless Telemetry Tool	400	to	700	1994	$10	to	$17
Software for Interpreting Old Electrical Survey Logs	500	to	1,500	1994	$2	to	$7
Produced Water Treatment Calculation Cost Model (ProWCalc)	150	to	250	1995	$8	to	$14
Successful Drilling Practices	1,000	to	2,000	1995	$85	to	$169
Eppendorf CS-200 Analyzer for Optimization of Amine Unit Operations	40	to	80	1995	$33	to	$66
CO_2 Membrane Database	150	to	250	1995	$2	to	$4
R-BTEX Emissions Control Process	800	to	1,600	1995	$104	to	$209
Secondary Gas Recovery, Gulf Coast and Mid-Continent	***			1995	$1,196	to	$2,016
Improved Coal Seam Gas Content Measurement Method (CoreGas Database)	100	to	200	1995	$9	to	$18
Fourier Transform Infrared Technique (FTIR) for HAPs Measurements	1,000	to	3,000	1995	$16	to	$48
GRI-HAPCalc Screening Tool	15,000	to	30,000	1995	$29	to	$57
Production Water/Waste Management and Site Remediation Treatment Technology Database, GRI-TTBD	300	to	600	1995	$3	to	$6
Chemicals Used in Gas Operations Database, GRIChem-USE	300	to	700	1995	5	to	11
Drilling Waste Atlas and Produced Water Atlas	200	to	400	1995	$13	to	$25
Scavenger CalcBase Database	*15	to	30	1996	$42	to	$84
Title V Permitting Guidance	1,000	to	3,000	1996	$1	to	$4
Environmental Technology Information Center (ETIC)	20,000	to	50,000	1996	$2	to	$5
Granular Activated Carbon-Fluidized Bed Reactor (GAC-FBR)	5	to	10	1996	$4	to	$8
Emerging Resources in the Greater Green River Basin	1,000	to	2,000	1996	$194	to	$389
Underbalanced Drilling Manual	4,000	to	8,000	1997	$25	to	$51
Mercury Soil Contamination Program	100,000	to	300,000	1997	$147	to	$441
Glycol Dehydrator Controls/Monitoring	6,000	to	12,000	1997	$93	to	$186
TOTAL (million of 1997 dollars, 5% discount rate)					$7,238	to	$14,008

* Enhancement to a previous winner for a new market application.

** Net present value calculations based on a real discount rate of 5% (excluding inflation), stated in 1997 dollars.

*** Benefits are based on user feedback about technical and market influence of the group of the information items.

Table 3. Total Expected Benefits by Sector (Millions of 1997$)	
• Residential	$478
• Commercial	$998
• Industrial	$1,024
• Transportation	$14
• Power Generation	$456
• Gas Operations	$3,976
• Supply	$2,804
TOTAL	$9,750

GRI R&D Costs

Between January 1993 and December 1997, GRI outlays totaled $925 million. For comparison to the R&D benefits calculated above, the cost cash flow stream was converted to an equivalent net present value lump sum expenditure at the beginning of 1997. As with the benefits calculation, a 5% real discount rate was used in the net present value calculation. The calculated equivalent cost was $1.08 billion. These costs include all outlays made by GRI during the past 5-year period, not just the costs incurred to produce the 165 R&D products. Consequently, a portion of the calculated cost will yet generate benefits as additional products are commercialized in the future.

Benefit-to-Cost Ratio

Dividing the calculated benefits by the costs results in a calculated benefit-to-cost ratio range of 6.7 : 1 to 13 : 1 (benefits of $7.2 to $14.0 billion divided by outlays of $1.08 billion) with an expected value of 9 : 1 ($9.75 billion divided by $1.08 billion). In a similar analysis carried out in 1997 for R&D items placed in commercial use between 1992 and 1996, the calculated ratio of the benefits to gas customers to total GRI costs incurred during the same period was 7.1 to 1 [Reference 2, "1997 Winners Analysis"].

Continuing Successes of GRI R&D Results Commercialized Prior to 1993

Although the focus of this analysis has been on GRI's most recent successes, several past successes continue to significantly impact the markets in which they are used. GRI is proud of the continuing success of these products, and we believe that a few comments about some of them are appropriate here.

Residential Space Heating. The residential space heating sector has long been a stronghold for natural gas. With approximately 50 million natural gas heated homes (51% of the market, [1]), gas furnace sales represented 84 percent of all furnaces shipped in 1997. In 1997 shipments of gas furnaces totaled about 2 8 million units [4]. GRI's R&D program in space conditioning had its first major success in the central furnace market with the introduction of the Lennox Pulse™ Combustion furnace in 1981. This furnace is one of the most efficient furnaces on the market today with a steady-state efficiency of 96%. Within two years of the introduction of the pulse combustion furnace, every furnace manufacturer introduced a condensing high-efficiency (over 90% AFUE) furnace in the market. However, several condensing furnace models experienced problems with the condensed vapor, causing corrosion of internal furnace parts. GRI sponsored research on condensing appliances to: (1) define the corrosion environment in condensing heat exchanger; and (2) evaluate materials for corrosion resistance in the condensing heat exchanger environment. Based on results from GRI's research, manufacturers responded quickly by redesigning these furnaces using corrosion-resistant materials. GRI's contribution in the development of the pulse combustion furnace and the materials research for condensing furnaces have significantly contributed to the development of the high-efficiency furnace market. According to the "Air Conditioning, Heating & Refrigeration News" (March 29, 1993, pp. 38-39), "The advent of the pulse combustion furnace more than a decade ago brought about a watershed in contractor marketing practices A suggested installation price of two to three times that of an atmospheric gas furnace amused competitors –until it was proven that a substantial number of homeowners in colder climates were willing to scrap inefficient furnaces in good working order in order to gain fuel savings in the 50% range. Within two years, every furnace manufacturer was offering a condensing furnace line." In 1997, condensing furnaces captured about 25 percent of the gas furnace market.

Conventional gas furnaces have a long tradition of providing consumers with reliable, low-cost space heating and trouble-free venting. However, federal standards requiring a minimum 78% AFUE took effect in 1992. To increase efficiency, fan-assisted gas furnaces were developed that have lower flue-gas temperature, reduced air flow, and a combustion fan instead of a draft hood. Data from utilities and manufacturers indicate that these characteristics can increase condensation in venting systems designed for conventional atmospheric furnaces. High levels of condensation can cause premature corrosion in the vent and furnace, with associated repair costs. The need to prevent premature corrosion required changes in the recommended way of designing the vent system for most mid-efficiency furnaces. "The integrity of the gas industry within the residential market is at stake any time a significant change takes place which impacts the installation and proper operation of gas products," says Michael K. Barnett, Director of Planning & Residential Marketing, Alabama Gas Corporation (Alagasco). "Consumers will benefit from more efficient gas products, and it is the responsibility of our industry and our company to ensure that these products are installed properly and safely " GRI led an industry-wide effort to develop new venting guidelines for broad application. Through this Venting/Flue-Gas Management Project, recommendations for installation instructions and vent sizing tables were developed and disseminated to manufacturers for inclusion in all shipments of mid-efficiency fan-assisted gas furnaces. "GRI and the members of the Venting/Flue-Gas Management Project provided a non-judgmental technical forum within which the manufacturers could participate and learn," says William J. Thomaston, Director, Technical Assistance, Marketing, Alabama Gas Corporation. "This was no small accomplishment, due to the intense competition which exists within this increasingly consolidated industry." As a result of the GRI-led effort, new venting systems are properly sized for today's mid-efficiency fan-assisted furnaces and natural gas continues to be a safe, economical resource for meeting residential energy needs.

High Temperature Industrial Burners. High temperature industrial burners are employed by manufacturers in hundreds of different types of furnaces, ovens, reactors, kilns, and incinerators. Because of the great diversity of applications, process heating represents the industrial sector's most technologically complex market segment. In 1989, total energy consumption by manufacturers for process heating accounted for over 4.3 quadrillion BTU, with natural gas accounting for nearly one half or 2.2 quadrillion BTU. GRI pursues technological developments that will maintain gas as a cost-effective option for process heating and keep gas-based technologies abreast of current standards of convenience, performance, and environmental impact. For some applications the advantages of electrotechnologies –precise control, higher temperatures, and enhanced process capabilities– are becoming important enough to offset their traditional disadvantage of high operating cost. The R&D challenge for the natural gas industry is to identify and develop new, high-temperature, precision control technologies that exploit the qualities and capabilities of natural gas in order to provide a performance premium when using natural gas. Path-breaking R&D efforts in ceramic burner development and burner control technologies have since led to component, equipment, and process innovations in the high temperature market. Technologies include the Pyrocore® Burner, Regenerative Burner with Integral Heat Recovery, NO_x Control for Glass Furnaces, Single-Ended Radiant Tube Burners, Industrial Fluid Heater, High Temperature Integral Quench Furnace, Vacuum Furnace, Ceramic Radiant Tubes, and a high-level gas injection process for blast furnaces. Advanced gas heat-treating technology, like the high efficiency TwinBed™ Burner developed by North American Manufacturing Company, has convinced some high volume customers to stay with natural gas. The TwinBed regenerative burner, developed with GRI R&D funding, permits the manufacturer to use an alternate fuel, but performs best with natural gas. The system consists of a compact regenerative heat exchanger to preheat combustion air, with a pair of burners that take turns firing and recovering heat. In 1993, the TwinBed burners accounted for approximately 38 Bcf of gross gas load. TwinBed burners have also been used with indirect-fired metallic radiant tubes, which heat products without exposing them to combustion gases. Inland Steel Company has seen fuel savings in excess of 45 percent when compared with the use of direct-fired burners and has not adopted the competing electrotechnology.

Blast Furnaces. Due to environmental regulations imposed on the pollutant emissions from coke ovens, metallurgical coke is increasingly scarce and expensive. In conjunction with this, the renewed steel demand has strained the productive capacity of the current blast furnace population. These two factors have poised the blast furnace industry to look for alternate fuel sources to decrease costs and increase productivity. The advantages of using high levels of natural gas include: reduced coke usage, improved furnace stability, increased iron-making productivity, lower operating costs, high quality (lower sulfur content) hot metal product, lower air pollution emissions, and gas-injection equipment has lower capital costs than pulverized-coal or oil-injection equipment. For over 25% of blast furnace coke requirements, high-level gas injection is an attractive substitute. However, there was insufficient information to determine the upper limit of natural gas injection to maximize its benefits. GRI and Charles River Associates have demonstrated the technical and operational value of using natural gas injection at high levels on blast furnaces. GRI supported the use of natural gas injection at high levels at Acme Steel Company, which has the last operational blast furnace in Chicago. Acme increased its rate of natural gas injection to 260lb/THM while it realized a production increase of 30%. Also, coke consumption went down by 30%. "The blast furnace ran very smoothly, and the hot metal chemistry remained right on target, allowing us to reach previously unattainable production levels," said Frank Gambol, Acme Steel Division Manager of Blast Furnaces. One of the major advantages of using natural gas as an injection fuel is its high hydrogen content which is very efficient at reducing the iron ore. Information and guidelines developed for the use of high level of natural gas in blast injection furnaces are refined and made available to iron and steel manufacturers throughout North America. Over the past decade, gas use has increased dramatically, growing from 38 Bcf in 1987 to 106 Bcf in 1995.

Natural Gas Vehicles. Vehicular transportation applications use large quantities of liquid fuels and are a major source of urban air pollution. There is a broad and increasing support for greater use of clean, alternative transportation fuels, such as natural gas. Approximately 63,000 NGVs were in use in the United States in 1996, virtually all in commercial fleets [3]. However, to attain a significant share of the transportation market, NGVs must overcome several technical and economic barriers. These barriers include the current range between refueling, an inadequate fueling station network, and the high capital cost premium of NGVs compared to liquid-fueled vehicles. GRI's objective is to develop and deploy NGVs and supporting infrastructure so that consumers can benefit from the economic, environmental, and energy security value of natural gas. Currently, several technologies developed with GRI funding are commercially available, including heavy- and medium-duty engines by Detroit Diesel Corporation and Cummins Engine Company, a light-duty CNG van by Chrysler Corporation, a dedicated natural gas passenger vehicle (Ford Crown Victoria), and a Qualified Vehicle Modifier Program (QVM) by Ford Motor Co. in which qualified outside companies convert Ford vehicles to operate on gas in selected markets. In 1996, new gas engines serving the medium- and heavy-duty fleet vehicle markets were introduced by Cummins Engine Company and Detroit Diesel Corporation. Also, John Deere Company, Caterpillar Inc., and Mack Trucks, Inc. entered the NGV market and Ford introduced dedicated gas-powered Vans and Pickups originally offered as QVM bifuel vehicles. In addition, GRI conducts studies to improve the performance and durability of natural gas engines. GRI's general strategy is to lead in technical development, innovation, and deployment of NGVs by addressing the following issues: the vehicle range and capital cost by developing innovative, lighter, and less expensive fuel storage systems; the fueling infrastructure; support quality bifuel conversion in the near term; develop efficient, dedicated OEM engines in the long-term; facilitate commercialization of NGVs through coordination with GRI member companies, manufacturers, and other organizations; pursue deployment of NGV technologies through various means including extended field tests; and provide safety research data as necessary to facilitate the regulatory process.

Advanced Stimulation Technologies (AST). GRI's AST program encompasses multiple technologies such as: quality control; stress profiling; and a 3-D modeling software program (FRACPRO™). These various stimulation techniques aid producers in optimizing the hydraulic fracture design and executions FRACPRO was developed to estimate total fluid and sand needed to generate cost effective fracture treatments while enhancing ultimate production. An engineer can design, analyze, and evaluate the success of fracture treatments so that more gas can be recovered from tight sands and other low-permeability formations Main benefits involve increased gas production and/or decreased fracture treatment costs. In the early 1980s, Gas Research Institute began a comprehensive research effort to evaluate and enhance technologies associated with hydraulic fracturing Through a series of cooperative research and Staged Field Experiment wells, GRI collected evidence that challenged traditional hydraulic fracturing methodologies and theories. By analyzing detailed reservoir data and real-time fracture treatment data, new insights into the fracturing process were gained, and critical factors associated with successful fracture treatments were identified. These insights formed the core of GRI's ongoing AST deployment program. Although there are many interrelated concepts in the AST approach, all involve the acquisition and analysis of data in real time to improve fracturing results. The primary elements of AST include: onsite treatment quality control; pretreatment stress profiling and the use of 3-D fracture models; fracture treatment pressure history matching (in real time or offsite), and performing fracture treatment diagnostics on location to identify well-specific fracturing mechanisms (near-wellbore tortuosity, multiple fracture creation, etc.). As part of the AST deployment project, GRI developed a Communication Tool Kit that explains the methodology and technologies within AST. This Tool Kit is available to industry and includes a new 38-minute video introduction to AST, concise technology descriptions of key AST elements, and an eight-part training manual with more than 500 slides, sufficient for over 30 hours of instruction. Short courses and in-house GRI training programs are being used to increase the number of producing and service company personnel using AST on a regular basis. The rapid adoption of these technologies will help the industry develop more gas reserves, more quickly and at lower cost.

Conclusions

GRI's planning and budget allocation process strives to put in place a program with the maximum ratio of benefits to R&D costs for the mutual benefit of the gas customer and the gas industry. The economic evaluation of GRI's commercially successful R&D results have consistently shown that benefits far exceed the costs of the R&D program.

Analysis of the benefits of approximately 111 of the 165 GRI R&D items placed into commercial service between January 1993 and December 1997 shows that GRI R&D will return about $9 for every dollar invested in GRI during the same period. In addition to the fact that only portion of GRI's commercialized R&D items are included in the benefits calculation, all of the costs of GRI's operations during the 1993 to 1997 period have been included in the calculation of the benefit-to-cost ratio.

References

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3. "Alternatives to Traditional Transportation Fuels 1995," Volume 1, Energy Information Administration, DOE/EIA-0585(95), December 1996.

4. "Statistical Panorama," The Air Conditioning, Heating and Refrigeration NEWS," April 13, 1998, pp.21.

Appendix A
GRI R&D Results That Have Been Placed in Commercial Use in 1997

RESIDENTIAL

Outdoor Gas Water Heater. American Water Heater Company has developed the Weather-Pro water heater, a residential/light commercial gas unit designed for easy outdoor installation and low operating costs. Currently, most gas-fired water heaters are installed indoors in basements, closets or garages. In warm regions of the country, many buildings do not have basements, so indoor water heaters occupy valuable living area or commercial space. While outdoor installation eliminates the need for venting, chimney paths and drip pans, until now gas water heaters could be installed outdoors in mild climates only if protected by a shed. The Weather-Pro's tough construction allows customers in warm regions to place the unit outdoors without a costly protective enclosure. In addition, the Weather-Pro requires no electrical hookup, thus reducing installation costs and enabling operation during power outages. The Weather-Pro has an input of 50,000 Btu/hr, enough for small commercial users, compared with an average of only 15,354 Btu/hr for standard residential electric water heaters.

Advanced Gas Fireplace. Lennox Industries has introduced a new enhanced gas fireplace to complement their extensive product line of gas hearth appliances. The result of extensive consumer research and comparisons of existing technologies, the Advanced Gas Fireplace combines the most popular product and safety features. Innovative burner port design and materials enhance flame realism and reduce emissions. The new fireplace also employs an advanced control system accessed by a wall-mounted remote control. Its modular design ensures easy installation and servicing while interchangeable log assemblies provide a range of aesthetic options. The Lennox fireplace represents the next generation of hearth products in the fastest growing segment of the residential natural gas appliance market. In addition to the product enhancements for Lennox, the generic burner design guidelines for improved efficiency and realism will be available to any gas hearth product manufacturer.

COMMERCIAL

BinMaker™: The Weather Summary Tool. BinMaker™ software tool, developed by GARD Analytics, Inc., Quantitative Decision Support, Linric Co., and Bluejay Software Associates, upgrades bin energy analysis by creating a wide range of accurate summaries of U.S. hourly weather data for 239 locations Weather data files used by BinMaker are based on the TMY-2 (Typical Meteorological Year) data produced by the National Renewable Energy Laboratory in Golden, CO. The files reflect typical weather for all 8760 hours per year at 239 locations. They contain actual weather observations rather than smoothed or adjusted data, ensuring of a good presentation of weather behavior in the real world The resulting electronic file can be exported for use in spreadsheets or other computer analysis programs BinMaker CD-ROM-based program runs under Windows® 95 or 3.1. Among its other features, BinMaker avoids the error of underestimating loads associated with coincident variables by creating a joint-frequency table of hours at each combination of temperature and humidity.

TecoFROST™ Gas Engine Driven Refrigeration. GRI has formed a partnership with two divisions of ThermoPower Corporation—Tecogen, which markets TECOCHILL® gas engine-driven chillers, and FES, which manufactures packaged refrigeration compressors and TECOCHILL units—to develop the TecoFROST™ refrigeration system. The TecoFROST system, manufactured by FES and marketed by Tecogen, utilizes the same reliable refrigeration components - screw compressor, oil separator - as electric refrigeration systems manufactured by FES. The electric motor is simply replaced by a more efficient natural gas engine, the TecoDrive 7400, an industrial version of the General Motors 7.4-liter V8, which was developed with GRI support. Because the engine operates at variable speeds (ranging from 2000 to 3000 rpm), the system can follow refrigeration loads more closely than an electric motor, which optimizes energy consumption. The control panel on the TecoFROST features precise and efficient operating control to ensure high reliability. It also features a Remote Monitoring Control System (RMCS) for off-site monitoring and trouble-shooting. The TecoFROST uses non-CFC refrigerants (R-717 or R-22). The TecoFROST system is available for refrigeration applications as low as -70°F and up to 45°F. Sizes range from 100 to 150 hp (up to 140 tons). Tecogen is currently designing larger systems with capacities of 200-500 hp. Low emission packages are available as an option to meet all local emissions standards. Other options include engine jacket and exhaust heat recovery.

York Millennium™ GED, Model YB. York's Millennium™ line was developed by York and Caterpillar Inc. in partnership with GRI and was introduced in 1994. Millennium products are based on Caterpillar engines and York centrifugal compressors. The product line offers single-stage, centrifugal chillers with capacities from 400 tons to 2,100 tons, using HFC refrigerant 134a. The Millennium chillers have an exceptionally high part-load efficiency, a COP of 2.6 (highest heating value without heat recovery), and are supported by a York and Caterpillar service network. At the Gas Cooling Technology Conference & Expo in May, 1997, York unveiled a 400-ton gas-engine-driven (GED) chiller with a footprint equivalent to the electric competition. The YB model integrates an industrial-grade Caterpillar engine (turbocharged six-cylinder, 365-hp) with York's high- efficiency centrifugal compressor. The full-load coefficient of performance (COP) of the YB chiller is 1.8 at Air-conditioning and Refrigeration Institute (ARI) design conditions and based on the fuel's higher heating value (HHV). When heat is recovered from the chiller's engine and put to use, the system COP (HHV) increases to 2.2, generating additional cost savings. To shrink the chiller's footprint, York packaged all of the engine/compressor components in a steel driveline base and mounted it on the evaporator/condenser tube sheets using neoprene vibration isolators. The rigid driveline maintains the integrity of the system, minimizes vibration on heat exchanger shells, and allows easy disassembly/reassembly if necessary to fit through narrow, low-overhead passageways during installation.

***Pulse-Combustion Hydronic Boiler.** Fulton Boiler has recently been able to improve the power-density of their pulse-combustion hydronic boiler by a factor of two However, the sound level of the product was increased by 3dba in the process, an unacceptable result. Under the leadership of GRI's Gas Appliance Technology Center (GATC), a team of experts in sound transmission and abatement was quickly assembled to address the issue and to make recommendations for solution. The team identified 61 concepts for sound reduction. Of these, 24 were selected as 1st effort candidates. Within two more weeks, Fulton had selected and tested six of these and found them to be very effective in sound reduction without compromising product design The result: a 10dba drop in sound level, well below the initial target. Fulton introduced the new line of boilers the next month at the 1997 ASHRAE show in Philadelphia. The benefits of this new line include high power density (small footprint for the same output), quieter operation, and a significant cost reduction.

TRANSPORTATION

FuelMaker-Quantum Vehicle Refueling Appliance Line. A well-established manufacturer of vehicle refueling appliances, FuelMaker Corporation produces a variety of compressors including the low-cost FM4 unit, ideal for time-filling of small and growing fleets GRI, along with Natural Resources Canada and Gas Technology Canada, supported efforts to make this unit even more economical and useful to a greater variety of fleets. The resulting "Quantum" product line includes three single-compressor and two multi-compressor models, featuring increased gas flow rate, longer service intervals, and elevated discharge pressures. Improving the flow rate from 1.9 scfm to up to 10 scfm for the multi-compressor model reduces the number of refueling appliances needed per fleet. In addition, the two units capable of pressures of 3600 psi extend the driving range of some NGVs. Together with the longer service interval, enhancements in the FuelMaker product line result in a 38% operating cost improvement. The FuelMaker is the only compression system certified by the International Approval Services (IAS).

AccuFill Dispenser Fill Algorithm. During fast-filling of vehicle CNG tanks, the gas temperature inside the cylinder can rise rapidly to 150-160°F. Soon after the dispenser stops filling, the gas inside cools to ambient temperature, and the internal pressure drops, resulting in the underfilling of the tank by up to 20%. This temperature-rise phenomenon was identified by the Institute of Gas Technology, in a GRI-sponsored research, as the worst culprit in the underfilling of NGV tanks. Some dispensers currently attempt to offset these factors during slow time-filling using ambient-temperature compensation devices, but they cannot give a complete fill in fast-fill applications. The new control software, now being licensed to dispenser manufacturers, provides a complete, safe fill under many conditions within 4% of maximum capacity. Walking the line between under filling and over filling will translate to an increased driving range of nearly 10-20% for fast-filled CNG vehicles.

NGV-1 Receptacle/Nozzle Standard Design. In the infancy of the natural gas vehicle market, several refueling accessory manufacturers produced varied and incompatible nozzles and vehicle fueling receptacles Fleet and refueling station managers were forced to chose a nozzle configuration and then purchase expensive attachments to adapt to other vehicles or stations. In 1994, ANSI, A.G.A. and CGA published standards developed by a GRI program that addressed the design and testing of compressed gas fueling station dispenser nozzles and vehicle receptacles. Entitled NGV-1 "Compressed Natural Gas Vehicle Fueling Connection Devices," the standard ensures interchangeability between products made by different manufacturers. Now almost universally adopted in the NGV market, the NGV-1 nozzle standard has reduced refueling connector costs by up to 50%. Fleet and station managers can more efficiently and safely service the growing population of natural gas vehicles.

POWER GENERATION

***Allison LE IV Dry, Low-Emissions (DLE) Combustor.** In partnership with GRI, Allison Engine Company has developed a dry, low emission combustor-called the LE IV-for its 501K series of 4-MW gas turbines. At a lower cost than selective catalytic reduction (SCR), and without the added maintenance requirements and increased CO emissions of water-injection, the LE combustor reduces NO_x emissions to less than 25 ppm. Both gas pipeline operators and industrial power generators can meet emissions requirements without reducing turbine operation or incurring excessive expenses and constraints associated with other emission control techniques.

***General Electric LM 1600.** In conjunction with GRI, General Electric has developed a dry, low emission annular combustion system for the 13.75-MW LM 1600 aeroderivative gas turbine. The new DLE system dramatically improves the economics of the new installations, as-well-as offering a low cost compliance option for environmental regulations In full engine test at GE, emissions goals of 25 ppm NO_x, 25 ppm CO, and 20 ppm UHC were met or exceeded.

GAS OPERATIONS

***Orifice Meter Information.** Data developed and collected through GRI-funded projects at the National Institute of Standards and Technology (NIST) and Southwest Research Institute (SwRI) have been used by several gas industry organizations to calculate biases in orifice meter discharge coefficient measurements. These corrections have been used to increase the accuracy of orifice meter measurement and in studies to determine unaccounted-for gas by gas utilities. SwRI also has conducted research to investigate the benefit and feasibility of fitting flow conditioning devices, to assure proper flow conditions upstream of the orifice plate, into new and existing metering installations built to conform with American Gas Association Report No. 3. In an orifice meter installation, the purpose of the flow conditioner is to remove flow disturbances (such as swirl and velocity profile asymmetry) that may arise from common types of pipe fittings, such as elbows, tees and valves upstream of the meter run. The flow conditioner is placed in the meter tube between the disturbing pipe fitting and the orifice meter. The purpose of the flow conditioner device is to remove flow disturbances so values of the orifice discharge coefficients, C_d, are indiscernible from baseline values. Baseline orifice C_d data taken at the Metering Research Facility (MRF), flowing nitrogen, agree well with comparable high accuracy baseline data from other laboratories. The results of the SwRI research effort establish the flow measurement credentials of the MRF Low Pressure Loop. With the completion of the commissioning of the MRF High Pressure Loop, the orifice meter research was expanded to cover larger meter sizes (10") and higher flow/pressure conditions. Also, research was conducted to evaluate various orifice meter configurations without a flow conditioner. This research is being guided by an API working group for revision of the A.G.A./API/ANSI/GPA orifice meter standard (Chapter 14 3, Part 2 - Installation Requirements). The research will support necessary installation specification revisions for use with and without flow straighteners (tube-bundle) and the use of new, improved flow conditioning devices.

Pipeline Current Mapper. GRI and its industry partners have developed a new system that can significantly cut the cost of determining the effectiveness of cathodic protection systems for steel piping systems used to transport natural gas. The Pipeline Current Mapper (PCM) system—manufactured by Radiodetection Corporation—can be used to detect coating defects and points where underground metallic structures come in contact with the pipe. Use of the PCM system by two companies provided an estimated 50% increase in productivity over conventional methods. The payback period was less than six months due to savings in labor, excavations, and a substantial reduction in the number of "electrical test stations" installed to provide a metallic connection to the pipeline.

RENU Service Renewal Technology. GRI and NICOR Technologies Inc. (NTI) have adapted a British technology for U.S. use—named RENU™—that provides an innovative trenchless, time and money-saving technology for renewing gas service lines. Because of the significant potential benefits, GRI funded with NTI both the transfer and the adaptation of the technology. NTI has a license to introduce the product in the United States and Canada. In the time it usually takes a crew (three or four men) to replace one service line using traditional methods of trenching or digging, two crew members can replace three or four lines using the RENU method. This means increased productivity and reduced labor costs for utility companies and contractors. A further advantage is that the equipment and tools for RENU fit easily into a small van, reducing the need for larger, more expensive utility trucks. The technology significantly reduces or eliminates landscaping and paving restoration costs and inconveniences associated with traditional repair and replacement methods. With RENU, standard polyethylene pipe is used for replacement and the method can be used in a variety of weather conditions. Initial installations conducted by Nicor Gas resulted in savings of more than 20 percent over conventional methods

Pneumatic Tool Diagnostic System (Tool Tester). The Pneumatic Tool Diagnostic System (PTDS) provides a new means to quickly and accurately assess the performance of air-powered tools, such as pavement breakers, rock drills, tampers, and air compressors. Delivered blow energy, blow rate, air pressure, air flow, and rotational speeds are measured and stored in a computer database. The database tracks all tools by inventory number and stores each tool's performance test results and maintenance cost history. The test results allow the operator to quickly pinpoint the area of sub-par performance and then verify that proper operation has been restored after repair. Many utilities use pneumatic tools for hundreds of thousands of man-hours annually and may have inventories of several hundred to several thousand such tools. Field tests with three large U.S. gas utilities of the PTDS proved the system to be reliable and accurate. In addition, studies have shown that tool inefficiencies can cost tens of thousands of man-hours annually. Periodic testing of tools in inventory with the PTDS greatly reduces these losses

Horizontal Directional Drilling Guidelines. Directional drilling is a no-dig (trenchless) technology, increasingly used by gas utilities to install polyethylene pipes. It involves drilling a pilot hole from the entrance pit to the exit pit to define the installation profile, and pulling the pipeline from the exit pit to the entrance pit as the bore is enlarged through a back-reaming process. Some of the benefits are the ability to install pipelines in tight spaces, the cost-effectiveness of drilling compared to open trenching, the reduction in inconvenience to customers and neighborhoods, and the ability to install pipelines in environmentally sensitive areas. GRI developed guidelines for directional drilling from interviews with gas utilities that use in-house drilling crews, pipeline contractors, and construction companies that perform drilling operations. Additionally, the guidelines include the results of analyses performed on such issues as maximum pull length for a given size pipe. The guidelines are the best practices that should benefit gas utilities by enabling them to develop company-specific internal standards, specifications for contracting for services, and training and quality control procedures.

Hydrostatic Test Water Discharge. Federal (DOT) and state laws require natural gas pipeline companies to maintain the integrity of their pipelines to protect the public from accidents involving potential failure of the pipelines. Hydrostatic testing is the method of choice for verifying pipeline integrity. Little information on the characterization, management, and permitting of hydrostatic test water discharges has been available until recently Sampling protocols, characterization requirements, permitting procedures, and discharge criteria vary substantially among states. Because of this, the gas industry faces a formidable challenge in developing technically feasible and cost effective approaches to managing hydrostatic test water discharges. In response to these issues and the possibility of more stringent regulatory requirements relating to the discharge of pipeline waters, GRI sponsored an effort to develop industry-specific information on test water discharges. The results of this research effort were documented in a five volume set of GRI reports published in 1992. The most recent GRI-sponsored effort consists of two complementary research programs. The objectives of the first research program were to determine the number of hydrostatic tests for new and used natural gas pipelines, determine the volume of water discharged, determine the management practices used for the discharged test water, assess federal and state regulations pertaining to hydrostatic testing, and to determine research issues. The objectives of the second research program were to develop representative hydrostatic test water characterization data for benzene, BTEX, oil and grease and total solids (TSS) under FIFO (first in, first out) discharge conditions and FILO (first in, last out) discharge conditions, and determine the effectiveness of new and normal industry control devices and water management procedures. A cost effectiveness study showed that pigging was the most effective means of reducing test water contamination, that filter covered hay bales reduced both oil & grease effectively when the pipeline was not pigged, and that air stripping was not cost effective

PCB Contaminated Pipeline Abandonment Protocol. Fluids containing polychlorinated biphenyls (PCBs) were used as lubricants in natural gas transmission and air compressor systems. Evidence of external contamination from PCB condensate discharged from transmission and distribution systems was discovered about 1987. Use and disposal of materials contaminated with PCBs is governed under the Toxic Substances Control Act (TSCA) and various regulations promulgated by the U.S. Environmental Protection Agency (EPA) in response to TSCA. In 1989, GRI initiated a PCB management research program to investigate innovative PCB management and control technologies. The purpose was to support the gas industry with technical information and management guidance on PCBs, particularly in the areas of statistical sampling, analytical methods, transport, risk assessment, remediation, and removal and control technologies. In the risk assessment phase of the project, a PCB Task Force assessed the potential risks associated with hypothetical releases of PCB-contaminated condensate from natural gas pipelines. The task force evaluated five release scenarios. Results indicated that human health risks associated with PCB releases from pipelines in many cases are within the acceptable range, suggesting that abandonment in place may be a viable disposal alternative. GRI published the information derived from this risk assessment in 1992 and produced a computer program that can be used to quantify the risk of cancer to humans from exposure to PCBs. In 1993, the research shifted in focus to mitigating PCB contamination in gas pipelines. Meeting this objective meant developing an understanding of PCB behavior in pipelines and on pipeline materials and translating this understanding into removal/control engineering guidance.

Low Cost Method for Formaldehyde Measurements. Title III of the 1990 Clean Air Act Amendments (CAAA) requires the U.S. Environmental Protection Agency to develop maximum achievable control technology (MACT) standards to reduce hazardous air pollutant (HAP) emissions from major sources. CAAA defines a major source of HAPs as any source that emits over 10 tons per year (tpy) of a single HAP or 25 tpy of a combination of HAPs. By the year 2000, EPA must issue MACT standards for combustion sources. The combustion source categories covered include stationary internal combustion engines, boilers, process heaters, and turbines. In addition to control requirements, the standards will stipulate monitoring requirements for determining compliance. Radian Corporation, a contractor for GRI, mapped emissions over the full operating range of clean-burn and lean-burn engines, and investigated alternative formaldehyde emission estimation approaches. With test data indicating that formaldehyde emissions vary with operating conditions and engine model, the program focused on identifying engine parameter-based models or low-cost measurement techniques that accurately estimate specific engine-specific formaldehyde emissions at the lowest possible cost. The project provides data and tools needed to develop an inexpensive, reliable method for estimating formaldehyde emissions, determines major source applicability, identifies and develops appropriate formaldehyde emissions control options, including operational modifications, design modifications, and add-on controls, and develops a low cost, reliable EM system to comply with the MACT requirements.

Contained Recovery of Oily Waste Technology Evaluation (CROW™) Technology for Water Cleanup. From the early 1800s to about 1960, manufactured gas plants converted coal or oil to a gaseous fuel, sometimes known as "town gas." The gas was used to light and heat homes, businesses, and factories throughout the United States, although most MGPs operated in cities and towns in the Midwest and East. Many abandoned or demolished MGP sites remain contaminated with wastes and residues associated either with the gas-producing and purifying processes used at these sites or with demolition activities. The Contained Recovery of Oily Waste (CROW™) process was developed and tested with funding from GRI and the EPA SITE program. The CROW process pumps hot water or steam into subsurface oily waste accumulations to make them less viscous and more buoyant and therefore more easily pumped to the surface.

CBT (Chemical-Biological Treatment) Cleanup Technology. Manufactured gas plant (MGP) operations, which generally ceased in the United States by about 1960, resulted in the release of various residuals and by-products to surrounding soils, sediments, and water. Of greatest concern are residual chemicals such as polynuclear aromatic hydrocarbons (PAHs), volatile aromatics, phenolics, inorganic chemicals, and trace metals. Some higher molecular weight PAHs are believed to be carcinogenic and PAH-contaminated soils are pervasive at many former MGP sites. Of the currently favored site remediation strategies, biological treatment appears to offer the best combination of relatively low cost and cleanup effectiveness. But in soils dominated by 4-6 ring PAHs, conventional biotreatment used alone is limited in its capacity to remove organic pollutants. Through a combination of two complementary remedial techniques - chemical oxidation and biological treatment - this limitation may be overcome. GRI, the Institute of Gas Technology's Sustaining Membership Program, U.S. EPA, and several gas companies have sponsored a research program to develop and evaluate an integrated chemical-biological treatment process capable of enhancing the rate and the extent of PAH degradation. The ultimate goal is a treatment technology that serves as a cost-effective alternative to landfilling, thermal treatment or incineration, and other technologies. The chemical-biological treatment is referred to as the MGP-REM process. Following pretreatment, microorganisms present in the PAH-contaminated soil biologically degrade the organic contaminants to carbon dioxide and water. The MGP-REM development and evaluation program consists of three phases: Solid-phase (landfarming) application of MGP-REM; Slurry-phase application of MGP-REM; and In Situ application of MGP-REM.

Gas Plant Emissions/Efficiency Report. This report is a result of a field evaluation of air emissions from combustion equipment at natural gas processing plants. The primary focus of the work was quantification of hazardous air pollutant emissions from natural gas-fired equipment, with other pollutants such as NO_x and CO also measured. Seven internal combustion engines, three incinerators, six heaters, three boilers, and three gas turbines were tested at five facilities. The internal combustion engines were found most likely to pose a potential regulatory concern, due to formaldehyde emissions. Other data indicated that the operating condition of the equipment can affect emissions, with engines tested before and after maintenance exhibiting a decrease in formaldehyde emissions and fuel consumption after maintenance was performed. This two-volume report consists of volume I, which describes the test program and reports the results, and a series of detailed data appendices in volume II. This is the second in a series of two reports presenting the results of a field evaluation of air emissions from combustion equipment at natural gas industry facilities. The first report focused on transmission compressor stations and storage facilities.

Lomic SonicWare™. Lomic, Inc. has developed a software package to assist natural gas metering engineers using ultrasonic metering devices. SonicWare™ provides the user with information to calibrate, monitor, audit and service ultrasonic meters.

Plastic Pipe Reliability (PENT Test). The Polyethylene Notch Test (PENT Test) is a newly developed testing method that facilitates the identification of slow crack growth (SCG) characteristics in polyethylene resin which subsequently identifies the longevity characteristics in polyethylene pipe used in the natural gas distribution industry. The PENT test is used by polyethylene resin manufacturers for broadly identifying important resin failure characteristics in pipe without having to use a more costly hydrostatic test to obtain similar information in PE pipe development. Also, the PENT test can identify SCG rates without having to test the PE pipe itself. The PENT Test can be done using a small sample of resin, eliminating the need to produce a section of pipe for testing.

SUPPLY

Mercury Soil Contamination Program. The natural gas industry used mercury manometers extensively to measure the flow of gas at wellheads, metering sites, and other gas industry operations. Several operational aspects may have caused mercury spillage from the manometers resulting in sites with mercury-contaminated soils. The release of elemental mercury into the natural environment from manometers is a potentially serious problem because of the toxicity of mercury. Research sponsored by GRI and the U.S. Department of Energy and conducted by the Energy & Environmental Research Center (EERC) to address this problem included an industry workshop with published proceedings, the publication of a critical literature review and citation database, a published review of remediation technologies, the development of a risk-based screening model, and a review of sampling and analytical methods for mercury. Additional research included monitoring of six field research sites, a study on containers and preservation techniques for mercury-contaminated samples, testing of thermal desorption. physical separation, chemical leaching and a combination of physical separation/chemical leaching. Activities to date have indicated: 1) contamination is extremely localized and does not migrate to shallow groundwater; 2) specific sampling and analytical techniques must be adopted to provide meaningful data. and 3) various remediation technologies can be used effectively to remove mercury from soil.

Offshore Atlases - Part 2. Radian International LLC, has updated the two-volume Atlas of Northern Gulf of Mexico natural gas and oil reservoirs with the most recent deep water drilling data in the Gulf Published in late 1997, it includes data on deep water exploration activities from January 1995 to December 1996, a period of significant drilling activity in the Gulf. The atlas provides petroleum geologists with a direct link to vital engineering and geological data, which is a valuable new tool to help guide producers in planning. leasing, acquisitions, and exploring and exploiting the deep water trend in the Gulf. The atlas includes state and federal data that have been compiled into a single source by the Texas Bureau of Economic Geology. The atlas takes 9,947 oil and gas reservoirs from 1,212 fields and classifies them into a geological framework for the region, sorts the sands and fields into plays. The fields represent a total cumulative production of 134 9 trillion cubic feet of natural gas and 12.1 billion barrels of oil. Volume I. published in June, 1997, is a 200-page portfolio that includes descriptions and cross sections of the Miocene and older reservoirs, which account for the majority of plays in the region. Volume II. released in late 1997, covers the younger, Plio-Pleistocene reservoirs, including deeper water plays The atlas also has a data component on CD-ROM that includes engineering attributes for the 9,947 reservoirs and 91 plays. The atlas is one in a series of six regional atlases on major natural gas plays developed by GRI, DOE and the MMS.

Appalachian Atlas. This is the most comprehensive atlas of natural gas and oil fields in the Appalachian Basin ever published. It is one in a series of six regional atlases on major natural gas plays. The Atlas of Major Appalachian Gas Plays features more than 700 maps, graphs, cross sections, stratigraphic columns, correlation charts, type logs, data tables, and references on more than 30 of the basin's most significant gas plays. It offers a comprehensive analysis of geological, engineering, and production data that will help producers identify exploration and development opportunities in the basin. The atlas is published by West Virginia Geological and Economic Survey.

Underbalanced Drilling Manual. GRI estimates that more than 30 percent of wells drilled in the United States could be safely and cost-effectively drilled using underbalanced technologies, which have been available since the 1970s. Currently, only about 10 percent of wells are drilled in this manner, due chiefly to a lack of knowledge and experience among producers about how to apply these technologies. To fill this knowledge gap, GRI contracted with Terra Tek Inc., to consolidate into one document a significant body of publicly-available knowledge, protocol and experience about underbalanced drilling. GRI's

Underbalanced Drilling Manual is a collation of industrial experience in underbalanced drilling. It is a state-of-the-art manual that provides the basic background knowledge for the evaluation, selection, design and planning of underbalanced drilling operations. The impacts of wider underbalanced drilling application are improved penetration rates (decreased drilling costs) and decreased formation damage. The manual characterizes various techniques and methodologies, including air, nitrogen, natural gas, mist, foam, mudcap drilling, flowdrilling, coiled tubing drilling, snub drilling, and closed systems. The manual is available from the Society of Petroleum Engineers or the International Association of Drilling Contractors.

Freeze/Thaw for Production Water. When natural gas is extracted at the wellhead or withdrawn from a storage reservoir, a substantial volume of water is co-produced with the gas. Produced water constitutes more than 80% of the wastes and residuals generated from the production of natural gas. Consequently, produced water management practices and water disposal costs are issues of growing importance. GRI supports research to identify and develop cost-effective and environmentally acceptable management strategies for produced water. One such treatment technology couples winter season freezing and thawing with summer season solar evaporation. The freeze-thaw/evaporation (FTE^{SM}) process works on the principle that a brine solution with elevated total dissolved solids (TDS) concentrations has a lower freezing point than purified water. The technology provides an opportunity to use natural conditions to purify or dispose of produced water year-round. A typical FTE facility design consists of a produced water holding pond, a freezing pad, and a treated water storage pond or facility. When the ambient temperature drops below 0°C, produced water is sprayed onto the freezing pad, forming an ice pile in the process. The dissolved solids concentrate in a brine, which drains from the pad. When the temperature is higher than 0°C, the ice pile melts and the treated water, which contains significantly lower TDS concentrations, drains from the freezing pad. Automated monitoring and processing through the use of a system of sensors and valves allows for ready identification and sorting of runoff. The brine is disposed of by conventional methods and the treated water is stored for later beneficial use or is discharged. Since 1992, research has been sponsored by Amoco Production Company, the U.S. Department of Energy, and GRI to develop a commercial, natural freeze-thaw/evaporation purification process for produced waters. Since 1995, B C. Technologies, Ltd. (BCT) and the University of North Dakota Energy and Environmental Research Center (EERC) have been successfully testing an automated produced water treatment and disposal facility that uses the FTE process. The FTE process has a definite economic advantage over conventional evaporation technology in climates with seasonal subfreezing ambient temperatures. Importantly, reduced water treatment/disposal costs can result in increased production from economically marginal gas resources and in the development of new unconventional sources such as coalbed methane.

Glycol Dehydrator Controls/Monitoring. Monitoring glycol dehydrator control devices in the field to verify compliance with emissions limitations could be expensive. To provide a more cost-effective method, GRI established a control device monitoring program to validate the concept that the condenser outlet temperature is the only control device parameter needed for monitoring a still vent condenser. Another objective was to collect the data needed to validate the potential use of computer programs, such as GRI-GLYCalc 3.0, to generate accurate, site-specific condenser curves. GRI contracted Radian International LLC to perform the data collection and field evaluation. Radian collected data during nine tests over a range of condenser configurations and operating temperatures. Several types of condensers, including air-, glycol-, and water-cooled, were tested. Each of the nine tests consisted of six runs. Radian used the field data as inputs for various computer modeling approaches and compared the modeling results with the field measurements. The results of the study show that condenser outlet temperature can be used as a monitoring parameter for a given unit. The data also shows that computer programs such as GRI-GLYCalc 3.0 can be used to develop site specific condenser control device emission efficiency curves for use in conjunction with outlet temperature as a control device monitoring tool. Computer modeling of condenser performance is expected to cost less than direct field measurement of performance.

Coalbed Reservoir Gas-In-Place Analysis Short Courses. Tesseract Corporation and TICORA Geosciences in conjunction with GRI developed an improved analysis protocol for determining the reservoir parameters used for calculating the gas-in-place volume of coalbed reservoirs. GRI's research showed that many commonly used methods for determining critical reservoir parameters such as the gross thickness, average rock density, and average in-situ sorbed gas content have inherent shortcomings which collectively can result in up to 50% or greater underestimation error in the gas-in-place volume. GRI's improved analysis protocol enables the more accurate determination of these three critical reservoir parameters. During 1997, GRI conducted three, 2-day short courses which provided hands-on training to 65 petroleum geologists and reservoir engineers in the use of this improved analysis protocol.

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* Enhancement to a previous winner.

Appendix B
GRI R&D Results That Have Been Placed in Commercial Use in 1993 Through 1997

RESIDENTIAL

1. York Triathlon™ Natural Gas Heating and Cooling System - 1994
2. Technology Options for Multifamily Housing - 1995
3. Water Heater Powered Desiccant Dehumidifier - 1995
4. Protocol for Water Heater Emissions Measurement - 1995
5. Venting Guidelines for 1996 National Fuel Gas Code - 1995
6. Test Protocols for High-Temperature Plastic Vents - 1995
7. Home Energy Rating System Guidelines - 1995
8. Compact Gas Meter - 1995
9. Gas Load Center - 1995
10. Carrier "Chimney Friendly" Furnace - 1996
11. Empire Gravity Vented Wall Furnace - 1996
12. Modulating Furnace by RHEEM - 1996
13. Utility-to-Customer Communication (Whisper) - 1996
14. Hearth Products Technology Base - 1996
15. Outdoor Gas Water Heater (American Water Heater Co) - 1997
16. Advanced Gas Fireplace (Lennox) - 1997

COMMERCIAL

17. Pulse Combustion Hydronic Boiler - 1989/91/97
18. Automated Deep-Fat Fryer -1993
19. 340RT Large Engine Chiller - 1994
20. 485RT Large Engine Chiller - 1994
21. Millennium™ Engine-Driven Chillers - 1994/95
22. Gas Combination Oven/Steamer - 1994
23. Standard Test Method for Performance of Steam Cookers - 1994
24. Standard Test Methods for Performance of Range Tops - 1994
25. Batch Booster Water Heater - 1995
26. Restaurant-Sized Steam Combination Oven - 1995
27. GATC Quick Response Activities - 1995
28. 725RT Large Engine Chiller (Tecogen) - 1995
29. Trane Modulating Rooftop Unit - 1996
30. Trane Horizon Absorption Chiller - 1996
31. Low Emissions Package for Engine Chillers - 1996
32. Separation Requirements in ASHRAE Standard 62-89R - 1996
33. Food Service Ventilation Code Data - 1996
34. BinMaker™: The Weather Summary Tool - 1997
35. TecoFROST™ Gas Engine Driven Refrigeration - 1997
36. York Millennium™ GED, Model YB - 1997

INDUSTRIAL

37. Ion-Nitriding GASFIRED™ Vacuum Furnace - 1994
38. Process Application of Composite Radiant Tubes - 1994
39. DONLEE TurboFire® XL Boiler - 1994
40. Heat Treat Furnaces - 1995
41. Low NO_x Air Staging for Glass Melting - 1995
42. Glass Tempering Furnace - 1995
43. Industrial Boiler Gas Cofiring - 1995
44. High Performance Infrared Burners - 1995
45. Steel Products Heating Furnace - 1995
46. ALZETA Pyrocore® Ceramic Fiber Burner for Various Heating Applications - 1985/96
47. Volatile Organic Compound Abatement Technology - 1996
48. CYCLOMAX® Low NO_x Industrial Burner - 1996

POWER GENERATION

49. Conventional Gas Reburn - 1995

TRANSPORTATION

50. Cummins L10-G Series - 1991/95
51. Chrysler Minivan - 1993
52. Advanced Conversion System of Vehicles to CNG - 1993
53. Hercules 3.7-liter NGV Engine - 1994
54. Cummins B5.9G Series - 1994
55. DDC Series 50G - 1994
56. CAP 4.3L Natural Gas Engine - 1994
57. Ford Motor Company's QVM (Qualified Vehicle Modifier) Program - 1994/95
58. Ford Crown Victoria Natural Gas Vehicle - 1995
59. Cummins C8.3G Engine - 1996
60. John Deere 8.1L Engine - 1996
61. DDC Series 30G - 1996
62. Caterpillar Dual-Fuel Truck Engine - 1996
63. MACK E7G Refuse Hauler - 1996
64. Ford Vans and Pickups - 1996
65. GFI/GEM Forklifts - 1996
66. FuelMaker-Quantum Vehicle Refueling Appliance Line - 1997
67. AccuFill Dispenser Fill Algorithm - 1997
68. NGV-1 Receptacle/Nozzle Standard Design - 1997

GAS OPERATIONS

69. Excess Flow Valve Information - 1985/94
70. Polyethylene Pipe Butt-Fused Joint Flaw Detectors - 1987/88/93
71. SoLoNO$_x$™ Gas Turbine Combustor - 1992/95

72. Electronic Marker System for Locating Buried PE Gas Pipes - 1993
73. Visual Internal Inspection System - 1993
74. Electrostatic Discharger System - 1993
75. Guidelines for Enhanced Electrofusion Joining Qualification and Acceptance Testing of PE Gas Pipes - 1993
76. LNGFIRE2 LNG Pool Fire Program - 1993
77. Compressor Diagnostic Software - 1993
78. GE Dry Low NO_x Combustor - 1993/97
79. ENSYS Rapid Field Test Kit for PCB Soil Contamination - 1993
80. GRI PCB Risk Assessment - 1993
81. GRI Groundwater and Contaminated Soil Environmental, Health and Safety Information System - 1993
82. LIFESPAN PE Program - 1994
83. Single-Line Electronic Flow Measurement (EFM) Device - 1994
84. Low-Cost NO_x Controls for 4-Cycle Ingersoll-Rand Pipeline Engines (Dresser-Rand) - 1994
85. Low-Cost NO_x Controls for 2-Cycle CLARK™ Pipeline Engines (Dresser-Rand) - 1994
86. Low-Cost NO_x Controls for 2-Cycle GMV Series Pipeline Engines (Cooper Industries) - 1994
87. Acoustic Pipe Tracer - 1995
88. Relining of Cast Iron and Steel Pipe - 1995
89. Coiled Plastic Pipe Information - 1995
90. Guidelines for Low-Cost, OSHA-Approved, Shoring Design and Materials - 1995
91. Plastic Pipe Across Bridges - 1995
92. SmartHeat™ Induction Fusion System - 1995
93. Soil Compaction Meter - 1995
94. RAPTOR Well Test Design and Analysis Software - 1995
95. OMNET Surface/Subsurface Modeling Software - 1995
96. Clock Spring® Composite Pipeline Repair Material - 1995
97. ASD CEMcat Continuous Emission Monitoring System - 1995
98. Allison 501-K Low NO_x Combustor - 1995/97
99. Inspection Vehicle for Unpiggable Lines - 1995
100. Methodology to Estimate Methane Emissions from Gas Operations (STAR Program) - 1995
101. Anaerobic Cast Iron Joint Repair Guide - 1996
102. DrillPath Guided Boring Software - 1996
103. Cast-Iron Maintenance and Optimization System (CIMOS) - 1989/1996
104. Assessment of Gas Pipeline Non-Destructive Evaluation (NDE) Technologies - 1996
105. Airborne Pipeline Integrity Monitoring (APIM) Assessment - 1996
106. Pipeline Inspection and Maintenance Optimization System (PIMOS) - 1996
107. Remote and Automatic Controlled Valves Guidelines - 1996
108. Risk Assessment/Risk Management Guidelines - 1996
109. Third-Party Damage Prevention Assessment - 1996
110. Carbon Monoxide Detector Supplemental Standards - 1996
111. Manufactured Gas Plant (MGP) Site Management Guidebooks (4 Volume set) - 1996
112. Cost Model for MGP Site Cleanups - 1996
113. Soil Cofiring in Utility Boilers at MGP Sites - 1996
114. Thermal Desorption for Soil Cleanup at MGP Sites - 1996
115. Orifice Meter Information - 1990/92/97
116. Pipeline Current Mapper - 1997
117. RENU Service Renewal Technology - 1997
118. Pneumatic Tool Diagnostic System (Tool Tester) - 1997
119. Horizontal Directional Drilling Guidelines - 1997

120.Hydrostatic Test Water Discharge - 1997
121.PCB Contaminated Pipeline Abandonment Protocol - 1997
122.Low Cost Method for Formaldehyde Measurements - 1997
123.Contained Recovery of Oily Waste Technology Evaluation (CROW) Technology for Water Cleanup - 1997
124.CBT (Chemical-Biological Treatment) Cleanup Technology - 1997
125.Gas Plant Emissions/Efficiency Report - 1997
126.Lomic SonicWare™ - 1997
127.Plastic Pipe Reliability (PENT Test) - 1997

SUPPLY

128.Atlas of Major Central and Eastern Gulf Coast Gas Reservoirs - 1993
129.Atlas of Major Mid-Continent Gas Reservoirs -1993
130.Atlas of Major Rocky Mountain Gas Reservoirs - 1993
131.Amplitude Variation with Offset - 1993
132.Tekstim® 3523 Coal Seam Surfactant - 1993
133.Gas Content Correlation for the Antrim Shale - 1993
134.Coalbed Methane Produced Water Management Guide - 1993
135.Quantitative Gas Measurement - 1994
136 Wireless Telemetry Tool - 1994
137 Electrical Survey Log Software - 1994
138.Successful Drilling Practices - 1995
139.Eppendorf CS-200 Analyzer for Optimization of Amine Unit Operations - 1995
140.CO_2 Membrane Database - 1995
141 R-BTEX Emissions Control Process - 1995
142.Secondary Gas Recovery, Gulf Coast and Mid-Continent - 1995
143 Produced Water Treatment Calculation Cost Model (ProWCalc) - 1995
144 Fourier Transform Infrared Technique (FTIR) for HAPs Measurements - 1995
145 GRI-HAPCalc Screening Tool - 1995
146 Production Water/Waste Management and Site Remediation Treatment Technology Database, GRI-TTBD - 1995
147.Chemicals Used in Gas Operations Database, GRIChem-USE - 1995
148.Drilling Waste Atlas and Produced Water Atlas - 1995
149.Improved Coal Seam Gas Content Measurement Method (CoreGas Database) - 1995
150 Emerging Resources in the Greater Green River Basin - 1996
151 Scavenger CalcBase Database - 1996
152.Fracturing Fluid Characterization Facility (FFCF) - 1996
153.A Guide to Determining Coalbed Gas Content - 1996
154.Coalbed Methane Engineering Manual - 1996
155.Gas Composition Database - 1996
156.Title V Permitting Guidance - 1996
157.Environmental Technology Information Center (ETIC) - 1996
158 Granular Activated Carbon-Fluidized Bed Reactor (GAC-FBR) - 1996
159.Mercury Soil Contamination Program - 1997
160 Offshore Atlases - Part 2 - 1997
161.Appalachian Atlas - 1997
162.Underbalanced Drilling Manual - 1997

163.Freeze/Thaw for Production Water - 1997
164 Glycol Dehydrator Controls/Monitoring - 1997
165.Coalbed Reservoir Gas-In-Place Analysis Short Courses - 1997

** This product is no longer available for sale or it has been superseded by a new model incorporating the GRI technology.

APPENDIX C - IGT MATERIAL

INSTITUTE OF GAS TECHNOLOGY

The Institute of Gas Technology (IGT) was organized in 1941 as a 501(c)3 not-for-profit Institute to conduct research and education for the benefit of the public. IGT has no stockholders or private investors. Board members are not paid No individual or company receives dividends or other financial benefits from IGT's operation. Membership in IGT is open to the public; currently IGT membership includes companies operating over 80% of the U S. gas meters, as well as pipeline, producer, manufacturer, and consultant organizations.

IGT research programs are funded entirely through competitively won contracts Primary sources of funding are federal and state government agencies, private sector contracts for specific research, and intermediate management organizations such as the Gas Research Institute (GRI) and the Electric Power Research Institute (EPRI) who collect funding from various sources and place contracts with performing organizations such as the Institute of Gas Technology.

IGT also maintains the Sustaining Membership Program, the Gas Industry's only broad-based voluntary research program. IGT has demonstrated 14 years of responsive and efficient program management and execution, maintaining management costs below 10% while leveraging the program 3 1 with co-funding from other sources

IGT is a research-performing entity, operating in excess of 400,000 sq ft. of research facilities. IGT currently employs approximately 150 staff, and has a fiscal 1998 operating budget of about $22 million

In addition to Education, IGT performs technology research and deployment in seven areas Biotechnology, Combustion Technology, Electrochemical Technology, Energy Systems and Business Analyses, Gas Operations Technology, Gas Processing Technology, and Process Development and Engineering. The mission of each of these areas is described below

BIOTECHNOLOGY

Mission: To develop and deploy highly-effective low-cost technologies for the remediation of contaminated sites Deployment of these technologies will minimize risk to humans and the environment while lowering the cost of compliance with federal and state environmental regulations

IGT's Biotechnology group continues to focus on developing technologies for remediating contaminated sites, especially former manufactured gas plant sites, to help the gas industry comply with federal and state environmental cleanup regulations With funding from the Gas Research Institute and the U S. Environmental Protection Agency, we have developed and field-tested through commercial scale, a family of remediation technologies capable of treating a wide range of contaminants in either an *in situ* or *ex situ* mode. Based on an integrated Chemical Biological Treatment (CBT) approach, this family of solutions includes

- MGP – REM for sites contaminated with PAHs such as former manufactured gas plant sites
- PCB – REM for sites contaminated with PCBs, TCE, etc.
- CYN – REM for sites contaminated with cyanide compounds
- TPH – REM for sites contaminated with petroleum hydrocarbons
- E&P – REM for the remediation of gas and oil exploration and production sites containing petroleum hydrocarbons and PAHs

IGT's CBT technology is already helping the natural gas industry through several full-scale projects:

- For Madison Gas and Electric, IGT is reducing contaminants in the groundwater and soil of an urban site containing three former gasholders by applying the CBT technology *in situ* Groundwater is being cleaned by air sparging and chemically enhanced bioventing, while soil contaminants are being eliminated by adjusting the pH and injecting CBT amendments to react with the contaminants and stimulate biodegradation
- A project with MidAmerican Energy Co illustrates the *ex situ* treatment mode in the form of landfarming Contaminated soil from the operation of an MGP facility, which had been moved offsite and disposed of in a dry riverbed, is being treated by the CBT process at an engineered landfarming facility Tests confirm destruction levels of 83% of total PAHs and 26% of carcinogenic PAHs can be attained.
- For Elizabethtown Gas Co , IGT applied another *ex situ* mode for the CBT technology — the soil slurry reactor Contaminated soil from a former MGP site was excavated and transported for remediation Since the contaminant level was relatively high, and only a small parcel of land was temporarily available for sighting the facility, the soil slurry reactor approach was chosen

COMBUSTION TECHNOLOGY

Mission: to develop and commercialize natural-gas-fired technologies for efficient, cost-effective, and environmentally friendly energy production, thermal processing of materials, and waste treatment These technologies enable compliance with new restrictive emissions regulations, protect US industrial production, and facilitate greater use of low-cost, environmentally beneficial natural gas.

IGT's Combustion Technology group reports continuing success in the deployment of improved natural-gas-fired systems for the industrial sector These advanced systems reduce NO_x emissions, boost productivity, increase thermal efficiency, and enhance product quality. Here are some of our major accomplishments toward meeting our mission goals

Oxygen-Enriched Air Staging (OEAS) Process for the Glass Industry

- Installed on a total of nine container glass furnaces, including seven endport and two sideport furnaces, the OEAS technology has consistently lowered NO_x to 2 lb/ton of glass, exceeding all current regulations.
- Reductions in NO_x emissions depend on the furnace conditions before installation of OEAS, but NO_x reductions of 50-70% are typical
- OEAS applications are widening. The first installation on a flat glass furnace is scheduled for the coming fiscal year

METHANE de-NOX for Utility and Industrial Boilers

- All eight coal-fired stoker boilers at Cogentrix Energy's 240-MW utility plant in Richmond, Va., are in continuous operation using the METHANE de-NOX reburn technology for NO_x control without urea injection. The boilers achieve about 60% NO_x reduction with 8% natural gas injection.
- DOE has awarded an IGT-led team to develop, deploy, and commercialize the METHANE de-NOX reburn technology for the forest and paper products industry.
- Meanwhile, Takuma Co. in Japan has conducted METHANE de-NOX demonstrations on two municipal solid waste plants, which met the required NO_x and CO reductions as well as significant dioxin reduction

Forced Internal Recirculation (FIR) Burner Technology for Industrial Boilers

- A 20 MMBtu/hr prototype FIR burner has demonstrated NO_x levels below 9 parts per million volumetric (ppmv) and logged over 4500 hours of continuous operation on an unattended industrial boiler at a Detroit Stoker Co facility in Monroe, MI
- Other installations underway include a 2.5 MMBtu/hr commercial prototype burner at Vandenberg Air Force Base and a 60 MMBtu/hr commercial prototype burner at the Miller Brewing Co plant in California
- John Zink Company is negotiating to license the FIR burner for firetube and process heater applications, and Detroit Stoker Co is negotiating to license the FIR for watertube applications
- Development of a FIR burner for composite radiant U-tube, indirect-heating applications is also underway

High Luminosity Oxy-Gas Burner for High-Temperature Furnaces

- Laboratory testing of prototype burners has shown significant increases in furnace productivity compared with conventional burners.
- With industrial partners Combustion Tec and Owens Corning, IGT will demonstrate this advanced oxygen-natural gas burner on a commercial fiberglass furnace in 1999

Direct Flame Impingement Heating for the Metals Industry

- IGT has been granted a worldwide exclusive license from Russian developers to develop, demonstrate, and market this cost-effective rapid-heating technology. The DFI technology has special gas-fired high-velocity jet burners that achieve 5-10 times greater convective heat transfer rates than conventional burners

- With our industrial partner Advanced Pyrometal Systems, we will adapt this technology to U.S heat-treating standards, design and test a laboratory furnace prototype, and demonstrate the technology at an industrial site

Oscillating Combustion for the Materials Heating Industry

- Oscillating combustion (OSC) technology is the forced. out-of-phase oscillation of the fuel and/or oxidant supplied to a conventional burner to create successive fuel-rich and fuel-lean zones within the combustion chamber, thereby increasing heat transfer to the load. boosting production rates. and reducing emissions
- This year. we are participating in a field demonstration of the oscillating combustion (OSC) technology as part of the Bethlehem Steel - DOE Energy Technology Showcase at Bethlehem Steel's Burns Harbor, Indiana, plant. The field unit is a 10 million Btu/hr indirect-fired stack annealing furnace equipped with 10 flat-flame burners. Each burner has been retrofitted with a CeramPhysics valve that rapidly oscillates the gas flow to each burner. Specially designed controllers provided by IGT control the operation of the oscillating valves. Field tests are underway to document the performance benefits of this technology and are expected to be concluded in late 1998

Low Inertia Furnace

- Prototype tests confirmed that the low-inertia furnace (LIF). which uses high-efficiency self-recuperated flat radiant panels, has faster heating and cooling rates than a radiant-tube furnace. This translates into reduced fuel consumption. increased specific furnace production. and smaller. more compact furnace cross-section
- Discussions with manufacturers are underway to demonstrate this technology in the steel. food. and paint-drying industries

ELECTROCHEMICAL TECHNOLOGY

Mission: To use electrochemistry and material science to develop and deploy low-cost low-emission fuel cells for distributed power generation and automotive applications. Distributed generation allows elimination of power transmission losses by generating clean power with natural gas at the point of need (home, business, etc)

In 1998. IGT's Electrochemical Technology group made great strides in fulfilling this mission in the areas of molten carbonate fuel cells. polymer electrolyte membrane fuel cells. and fuel processor development.

Molten Carbonate Fuel Cells

Our efforts to reduce costs and enhance endurance resulted in

- the design of strong. corrosion-resistant porous structures that perform both current collection and gas distribution functions
- the use of commercial grades of carbonates. rather than the more expensive analytical grades. without sacrificing performance or endurance

- a change in the carbonate composition from a mixture of lithium and potassium salts to a mixture of lithium and sodium salts.

Polymer Electrolyte Membrane Fuel Cell (PEMFC)

Working with a DOE program to reduce the cost of PEMFCs, our group developed inexpensive molded graphite bipolar separator plates for use in 5 to 200 kW stationary and vehicular applications. Our efforts successfully

- reduced the plate costs to $10/kW from an estimated cost of $250/kW for prior technology.
- produced full-scale plates that caused no loss in stack performance due to cell size or number of cells

Fuel Processor Development

To operate efficiently, PEMFCs require a processed feed gas that contains less than 20 ppm of CO. During 1998, using IR&D funds, we modified our reformer/shift/methanation process and reduced the CO content to 10-15 ppm levels The IGT methane reformer/shift/methanation process with low CO content in the reformate gas is a key component needed for any PEMFC development

ENERGY SYSTEMS AND BUSINESS ANALYSIS

Mission: To provide research, development, and commercialization services in the areas of alternative-fueled vehicles, space conditioning technologies, business analysis, and technology deployment These activities help reduce environmental emissions and greater deployment of natural gas utilization technologies.

Alternative-Fueled Vehicles

IGT's Energy System and Business Analysis group is developing leading-edge technologies for the NGV market that promise to reduce the cost and weight of on-board CNG storage, improve natural gas fueling systems, and enhance the cost-effectiveness of using LNG as a vehicle fuel

- Developed by IGT and Lucas Aerospace, a new ANSI NGV-Type 2 cylinder design is low-cost and lightweight and could enhance the marketability of NGVs This quick turn around program is expected to have these advanced cylinders on the market soon

- Our AccuFill natural gas fueling station dispenser control system has been licensed by GRI to three dispenser manufacturers With IGT support, they have successfully implemented the system Fueling test results in various ambient temperatures showed that the system fulfilled the design goals in field application Next, we plan to incorporate the Accufill system into an advanced fueling dispenser

- An advanced liquefier for producing small quantities of LNG is currently being developed at IGT for Brookhaven National Laboratory This liquefier, designed to be a small, shop-assembled, standardized unit, has the potential to produce LNG for areas previously not considered feasible, at a significantly reduced cost.

Space Conditioning Research

In support of equipment manufacturers and the gas industry in the development of competitive natural-gas-fired heating and cooling products and components, our space conditioning staff developed several sophisticated software products aimed at optimizing application of natural gas cooling and dehumidification technology to save energy and energy costs associated with air-conditioning buildings

- The DES3 computer model provides system engineers with a design tool for easy selection of the best desiccant material for a particular application
- DesiCalc is a fast, easy-to-use tool for evaluating the economic benefits of desiccant-based systems
- Gas Cooling Guide (GCG) is a multimedia technology based software designed for HVAC designers, operators, and marketers It provides easy-to-understand gas cooling technology descriptions, a large library of case studies, and an extensive product catalog The GCG Economic Analysis module estimates annual or monthly energy loads and costs associated with air-conditioning a given building and geographical location. The tool compares the performance of electric equipment with absorption, gas-engine-driven, or desiccant cooling systems

Business Analysis and Technology Application

To aid the natural gas industry in organizing data and applying new technologies, IGT established an Inert Gas Services Team for the storage industry and streamlined a data system for leak surveys

- Through an alliance with Air Liquide Corp of America, Equitable Resources, and Sofregaz/US, IGT established the Inert Gas Services Team (IGST) to offer a comprehensive solution source to the natural gas storage industry The Team's unique combination of products, expertise, and services are being applied to the development and deployment of inert gas technologies and systems. The Team is also helping companies identify, implement, and evaluate inert gas applications in their existing and new gas storage fields

- To streamline the process of evaluating and tracking leak information, our group migrated LeakView to the 3Com PalmPilot platform LeakView is the expert system for organizing and standardizing the collection of data at a leak site Using a popular PDA such as the PalmPilot instead of a specialized pen-based computer minimizes the cost of automating these functions

GAS OPERATIONS TECHNOLOGY

Mission: To be the supplier of choice for our customers in providing high quality, timely, and cost-effective research, testing, and commercial deployment support services in the areas of natural gas transmission and distribution operations These activities provide significant reduction in the cost of operations of transmission and distribution of natural gas

In keeping with this mission, IGT's Gas Operations Technology Group has pursued projects that have resulted in new or enhanced service capabilities, achieved greater operating efficiencies, leveraged gas industry technology development investments with government and manufacturer funds, and provided quick response to addressing the technical and operational concerns of its gas industry clients

In 1998, our specific activities focused on three areas of gas operations research. electronics and telecommunications, pipe rehabilitation, and pipeline corrosion protection.

Electronics and Telecommunications

- In a GRI-sponsored program, we developed an automatic pressure control system for district regulators in low- and medium-pressure gas distribution networks that lowers the average operating pressure of a gas distribution system, thereby reducing leakage and improving metering accuracy. Field tests on Consolidated Edison Co 's medium-pressure distribution system in New York demonstrated a 30% reduction in average system pressure and suggested that 60% may be possible The system will be commercially available from Fisher Controls next year
- The Smart Cathodic Protection Monitor is a wireless system for reading the cathodic protection currents and voltages significantly improves worker productivity and reduces the cost of cathodic protection monitoring Several prototypes of the Monitor are currently being field tested in Brooklyn Union's service territory. We estimate that use of this system will reduce the labor required for CP monitoring by 70%.

Pipe Rehabilitation

- IGT's sonic leak pinpointer can be used by utility field personnel to reduce the number of excavations required to locate and repair a leak This instrument uses state-of-the-art digital signal processing techniques to minimize the affects of background noise In a recent field test conducted with Chicago's Peoples Gas Light and Coke Co , the DSLP located a valve leak on a medium-pressure (18 psi) system and a leaking repair sleeve on a low-pressure (1/4 psi) system.
- The Magic Box is a device that clamps around a section of plastic pipe and performs the operations of cutting the pipe, removing the cut section, installing a new segment of pipe or valve or fitting, and electrofusing the new component into the existing line, all while the line is at operating pressure and flowing gas Successfully field tested at BG&E, Southwest Gas, and SoCal Gas the past year, the Magic Box will be part of Mueller Co 's product line next year

Pipeline Corrosion Protection

- Flamespray is an improved field-applied corrosion protection coating system and application method for pipeline girth welds, repair sites, and irregular fittings The new two-component flame coat/liquid epoxy system provides protection equal to that of fusion-bonded epoxy (FBE) but has the ease of application comparable to tapes Our commercialization partner, Commercial Resins Co plans on offering Flamespray to its customers later this year.

GAS PROCESSING TECHNOLOGY

Mission: To extend the gas resource base through improved, cost-effective processing of natural gas from conventional and tight formations and to develop advanced processes to improve the economics of upgrading subquality gases to pipeline quality

This IGT group is working with the upstream gas supply industry to make subquality gas resources economic to recover This year our efforts have focused on field testing a new physical solvent process for removing acid gas from sour gases.

Morphysorb Process Highlights

- It uses the physical solvent N-formyl morpholine and mixtures of morpholine derivatives for treating sour gas streams
- Compared to other solvents, Morphysorb reduces producers operating costs up to 60% or, in lieu of operating cost savings, increases the plant capacity up to 30%
- Over 100 field tests were conducted at 1000-psig wellhead conditions using IGT's pilot plant test unit with a sour gas slipstream that contained acid gas concentrations up to 43 mole %
- The solvent is suitable for Claus sulfur recovery or sulfuric acid production
- Smaller vessels and rotating equipment, all with carbon steel construction, result in low capital costs
- Operating costs are also low due to lower circulation rate and lower recycle gas flow
- This new process is now available through Krupp Uhde GmbH for immediate application for retrofits as well as new gas treating facilities

PROCESS DEVELOPMENT AND ENGINEERING

Mission: To develop fossil and renewable gasification technologies and to develop waste treatment technologies that will contribute to global environmental health and promote the use of natural gas

IGT's Process Development and Engineering group is working with industrial gas users around the world to fine-tune our gasification technologies to meet their gas supply needs

U-GAS

- With the continuing operation of IGT's first commercial U-GAS coal gasification plant in the People's Republic of China. US DOE is funding a cost shared project to begin a market study for the application of the U-GAS process to the rest of China
- The study will identify real projects for the application of the next U-GAS process.
- Candidate applications include industrial fuel gas for iron making, ceramic kilns, and glass furnaces: power generation using advanced integrated gasification combined-cycle (IGCC), methanol production including liquid phase methanol production; and ammonia production with enriched-air gasification

RENUGAS

- Through our RENUGAS biomass gasification technology, we are involved in the Minnesota Agri-Power Project (MAPP), which is aimed at converting 1000 tons per day of alfalfa stems to 75 MWe of power using integrated gasification combined-cycle (IGCC) technology.
- Late last year, Northern States Power signed a Power Purchase Agreement with Minnesota Valley Alfalfa Producers (MnVAP), the project owner, to purchase the power for their system.
- Engineering of the plant is underway, and the start of the power plant construction is scheduled for the middle of 1999

EDUCATION

Mission: To continuously improve our existing product and services, to position ourselves to be adaptable to the changing educational and training needs of our Members and the public: and to continuously explore new products, programs and delivery mechanisms that are responsive to the industry and public needs

Guided by the main mission of delivering quality programs in the most efficient, cost-effective manner, IGT's Education Division made several changes in our course and product offerings

Shorter Courses

- "Gas Distribution Operations," historically given as a two-week course, was redesigned as a one-week accelerated offering, which resulted in a 25% increase in attendance over last year
- A new one-week overview version of two certification programs, Chartered Industrial Gas Consultant (CIGC) and Registered Commercial Gas Consultant (RCGC), will soon be available to those needing knowledge of both areas

Onsite Delivery

- In response to Members' requests, we are taking existing courses on the road and customizing the content to fit a particular client's needs
- Having presented twenty on-site programs this past year, IGT's position now is that virtually

every program we offer can be delivered, with some modifications, to a client's location.

Computer Access

- Our complete revision of the Gas Distribution Home Study Course will soon be available on CD-ROM in English, with plans for a Spanish version under way

- In the next six to nine months, we plan on being online via the Internet with our current one-day course entitled "Introduction to the Natural Gas Industry"

- *gasLine* — IGT's electronic database of gas technology literature — is now available free through the Internet to IGT Members (gasline.igt org) and GRI/Net™ subscribers IGT and GRI have agreed to jointly support the development of this searchable database, which is updated continually, allowing users to stay abreast of new technologies, new products, and environmental, safety, and regulatory issues.

Newest Programs

- Our three sales programs created for on-site presentation, "12 C's of Selling Natural Gas," "Residential Natural Gas Sales," and "Selling Energy in a Deregulated Environment," proved very popular

- Our successful "Symposium and National Security Briefing on Natural Gas System Integrity in the Cyber Age" enabled us to receive a Department of Defense grant, the first in IGT's history We will be presenting a new related course entitled "Integrated Automation and Operations Security Training" in early 1999

- A new course, "The Fundamentals of Base-Load LNG Technology and Economics" was held in Houston in September 1998 The demand for this program was so strong that we had to schedule a second session for early November 1998

- We are developing plans to form an IGT LNG Consulting Group to offer consulting services on LNG-related topics to clients around the world

- In projects in Venezuela, Indonesia, and Trinidad and Tobago, we helped meet the educational and training needs of the international gas industry

"Alan Allred" <AlanA@questar com> on 09/14/2000 04 28 08 PM

To ron edelstein@gastechnology org
cc
Subject Re Rate Case

Each December we will include, as a part of our gas cost pass through, a request to reflect the new lower FERC pipeline surcharge and move the delta amount to the non-gas portion of our rates. The result will be that as the pipeline rate decreases the non-gas rate will increase a like amount and Questar Gas will collet the delta amounts and use them to support industry wide R&D.

>>> <ron.edelstein@gastechnology.org> 09/14/00 01:43PM >>>
Thanks Allen.

Does this need to be refiled each year to recover the delta funding as it increases, or is this now automatic within your rates?

Ron

- BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH -

In the Matter of the Application of Questar Gas Company for a General Increase In Rates And Charges	))))	DOCKET NO. 99-057-20 REPORT AND ORDER

ISSUED: August 11, 2000

SHORT TITLE

Questar Gas 1999 General (Distribution Non-Gas) Rate Case

SYNOPSIS

The Commission increases Questar Gas Company=s annual revenue requirement by $13,497,484. Of this amount, an interim rate increase of $7,065,000, granted January 25, 2000, is currently reflected in rates. Revenue requirement is based on an adjusted 1999 test year and an allowed rate of return on equity of 11 percent The Commission also adopts a low-income weatherization proposal.

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18. **Gas Research Institute**

The Company proposes an adjustment to increase expense in the test period by $215,932 to recover, in distribution non-gas rates, Gas Research Institute (AGRI@) funding of research and development (R&D). In the past, support for this R&D has come through payment of a FERC-approved charge which is included in interstate pipeline rates. The charge, about $2 million per year, has been collected from Questar Gas=s sales customers. The FERC has approved an agreement in a recent GRI proceeding to phase out the mandatory pipeline charge in yearly increments through 2004.

Corresponding to the decline in the FERC surcharge, the Company proposes to reduce supplier non-gas costs and to increase distribution non-gas costs. Total R&D costs recovered from customers would be unchanged. The 1999 reduction in the FERC surcharge is $215,932, an amount reflected in rates for Questar Gas=s Utah customers effective December 1, 1999. The Division and Committee propose to exclude any GRI amounts from test-year expenses, but for purposes of stipulation would withdraw the adjustment. This issue is addressed in Paragraph 11 of the Stipulation

19. **Reserve Accrual**

The Division proposes an adjustment to decrease expenses by $703,280 for a five-year amortization of $879,100 in a reserve accrual for the Company=s self-insurance program. The Company agrees with the proposal. In its direct testimony the Committee recommends exclusion of the entire amount from the test year, a further expense decrease of $175,820. For purposes of stipulation, the Committee would withdraw its adjustment.

E. CO_2 GAS PROCESSING COSTS

In Docket No. 98-057-12, the Company applied, among other things, for approval of its contract with an unregulated affiliate, Questar Transportation Services Company (AQTS@), for removal of carbon dioxide from central Utah Acoal seam@ gas which, transported by its affiliate, Questar Pipeline Company (AQPC@), was entering its distribution system. The Company contends that, by early 1998 when the likelihood of continuing increases in the volume of this

AVISTA Corp.

Department RATES
Fax Cover Memo
Fax #: 509-495-8058

Date: 8/8/00

Number of Pages: 3

TO: RANDY ST. AUGON (SP?)

Company: GRI

Phone Number:

Fax Number: 773-864-2806

FROM: BRIAN HIRSCHKORN

Phone Number: 509-495-4723

FYI: Immediate Reply Requested:

Copies to:

Remarks: EXCERPTS FROM OUR 11/30/99 PGA FILING. COMMISSION DOES NOT ISSUE AN ORDER APPROVING PGA FILINGS, SO THIS IS ABOUT ALL THERE IS FOR DOCUMENTATION. AMOUNT SPREAD/COLLECTED BY RATE SCHEDULE BASED ON UNIFORM % OF REVENUE.

Avista Corp.
1411 East Mission PO Box 3727
Spokane, Washington 99220-3727
Telephone 509-489-0500
Toll Free 800-727-9170

AVISTA Corp.

November 30, 1999

State of Washington
Washington Utilities & Transportation Commission
1300 S. Evergreen Park Drive
Olympia, Washington 98504-8002

Attention: Ms. Carole Washburn, Executive Secretary

TARIFF WN U-27 NATURAL GAS SERVICE

Enclosed for filing with the Washington Utilities and Transportation Commission are three copies of the following tariff sheets:

Second Revision Sheet B canceling First Revision Sheet B
First Revision Sheet 155 canceling Original Sheet 155
Second Revision Sheet 156 canceling First Revision Sheet 156

These proposed tariff sheets bear an effective date of January 1, 2000, and will result in an estimated annual revenue increase of approximately 12.98% or $9,707,000.

The estimated annual revenue change consists of an increase in the amount of gas costs recovered from customers of $5,893,000 and an increase in the Company's gas deferral/amortization rates of $3,814,000 The gas cost increase includes approximately $86,000 for voluntary funding for the Gas Research Institute (GRI). In 1998 FERC approved a settlement whereby pipeline funding of GRI, through rates collected from LDCs and other transportation customers, will be reduced on an annual basis through 2004, after which time pipeline funding would cease. GRI is requesting that LDCs contribute, on a voluntary basis, an annual amount equal to the lost pipeline funding The Company believes that the present and potential benefits to customers derived from GRI programs exceed the costs. As a contributor, the Company will have an active voice in how customer contributions are spent. If at any time the Company or the Commission believes that the benefits of GRI programs no longer exceed the costs, the Company would cease the charge collected from customers. Also included in the gas cost component is a credit of approximately $81,000 for A&G savings related to Tariff Schedule 163, Natural Gas Benchmark Mechanism.

The Company is basing its gas cost changes on PG&E Gas Transmission's Twenty-sixth Revised Sheet No. 4 effective November 1, 1999 and Northwest Pipeline Corporations Fourteenth Revised Sheet No. 5 effective January 1, 1999, Sub Seventh Revised Sheet No. 7 and Sub Eleventh Revised Sheet No. 8 effective March 1, 1998.

With this filing, the adjustments proposed on Second Revision Sheet 156 are an increase of 3.590 cents per therm to customers on Schedule 101, an increase of 3.577 cents per therm to customers on Schedules 111 and 112, an increase of 3.565 cents per therm to customers on Schedules 121 and 122, an increase of 3.555 cents per therm to customers on Schedules 131 and 132 and a decrease of 0.028 cents per therm to customers on Schedule 146.
.28

The estimated effect of the proposed Second Revision Sheet 156 tariff is an annual revenue increase of approximately $5,893,000.

5

Avista Utilities
State of Washington
Recap of Changes To Schedule 156
Proof of Rate Changes

		Commodity	Demand	GRI Funding	Total Inc <Dec>
Schedule 101	2/15/98	$0.00350	($0.02138)		($0.01788)
	1/1/00	$0.03067	$0.00472	$0.00051	$0.03590
		$0.03417	($0.01666)	$0.00051	$0.01802
Schedule 111	2/15/98	$0.00350	($0.02098)		($0.01748)
	1/1/00	$0.03067	$0.00469	$0.00041	$0.03577
		$0 03417	($0.01629)	$0.00041	$0.01829
Schedule 112	2/15/98	$0.00350	($0.02098)		($0.01748)
	1/1/00	$0.03067	$0.00469	$0.00041	$0.03577
		$0.03417	($0.01629)	$0.00041	$0.01829
Schedule 121	2/15/98	$0.00350	($0 02023)		($0.01673)
	1/1/00	$0 03067	$0 00465	$0.00033	$0.03565
		$0 03417	($0.01558)	$0.00033	$0.01892
Schedule 122	2/15/98	$0.00350	($0.02023)		($0.01673)
	1/1/00	$0.03067	$0.00465	$0.00033	$0.03565
		$0.03417	($0.01558)	$0.00033	$0.01892
Schedule 131	2/15/98	$0.00350	($0.01848)		($0.01498)
	1/1/00	$0.03067	$0.00458	$0.00030	$0.03555
		$0.03417	($0.01390)	$0.00030	$0.02057
Schedule 132	2/15/98	$0.00350	($0.01848)		($0.01498)
	1/1/00	$0 03067	$0 00458	$0.00030	$0.03555
		$0 03417	($0.01390)	$0.00030	$0.02057
Schedule 146	2/15/98		($0.00025)		($0.00025)
	1/1/00		($0 00034)	$0.00006	($0.00028)
			($0 00059)	$0.00006	($0.00053)

Q4GMR
12/8/99
NW-Commodity

BEFORE THE PUBLIC SERVICE COMMISSION OF WYOMING

IN THE MATTER OF THE APPLICATION OF)
QUESTAR GAS COMPANY FOR)
AUTHORITY TO PASS ON A GAS COST) DOCKET NO. 30010-GP-99-50
INCREASE OF $850,000 PER ANNUM) (RECORD NO. 5299)
($0.22309 PER DECATHERM))

NOTICE AND ORDER
(Issued December 8, 1999)

This matter is before the Commission upon the application of Questar Gas Company, hereinafter referred to as Questar or the Company, for authority to pass on to its customers, a net wholesale gas cost increase of $850,000 or $0.22309 per decatherm, with a proposed effective date of December 1, 1999.

The Commission, having reviewed the application, its files regarding Questar, applicable Wyoming utility law, and otherwise being fully advised in the premises, FINDS and CONCLUDES:

1. Questar is a public utility as defined in W.S. § 37-1-101 (a)(vi)(D) and, as such, is subject to the Commission's jurisdiction pursuant to the provisions of W.S. § 37-2-112.

2. On November 1, 1999, Questar filed this application requesting authority to pass-on, to its retail core customers, a net wholesale gas cost increase of $850,000 per annum or $0.22309 per decatherm. The Company states that this increase is due to a reduction in the 191 Account debit amortization and a projected increase in the cost of purchased gas. The Company is further requesting the recovery of its share of Gas Research Institute Research and Development costs (GRI costs) through the non-commodity portion of its retail rates. These GRI costs are currently being recovered through Federal Energy Regulatory Commission-approved pipeline rates. The FERC is proposing to phase out the recovery of these GRI costs through wholesale pipeline rates by year end 2004. As these rates are phased down over this period of time, the voluntary recovery of these costs is being shifted to local distribution companies, including Questar. Questar states that it and its customers benefit from the research that is conducted by the GRI and that recovery of these costs through its non-commodity portion of its rates is reasonable and appropriate.

3. Questar's current and proposed rates, per decatherm, are detailed in the following table:

Item	Company Proposed Rate, $/dth	Current Rate, $/dth	Difference
Gas Cost	$2.98580	$2.68134	$0.30446
Surcharge Adjustment	($0.02846)	$0.05291	($0.08137)
Total	**$2.95734**	**$2.73425**	**$0.22309**

4. Based upon Questar's filing, the average residential customer may expect to incur an annual gas cost increase of $27.03 or 4.2% based on an estimated annual gas usage of 120 decatherms.

5. Pursuant to Sections 249 and 250 of the Commission's Procedural Rules and Special Regulations, a utility may pass-on, to its customers, known or prospective wholesale commodity cost increases or decreases, under the following circumstances, subject to public notice, opportunity for hearing and refund:

a. The pass-on is for wholesale commodity cost changes which are not under the Commission's jurisdiction.

b. The pass-on does not increase a utility's's rate of return and the utility is earning at or below its last authorized rate-of-return.

c. The pass-on is applied to all rate classes in an equal or proportional manner.

d. The pass-on charges are filed as a separate, cumulative rate rider.

e. There are provisions for interest on over-collections.

f. The utility provides documentation that the commodity costs are the most economical option reasonably available.

6. Questar's application generally conforms to the above referenced requirements and is in compliance with the authorized use of a balancing account which was granted to the Company, by the Commission, in a previous docket.

7. The Commission further finds that Questar has fully supported its request that it be allowed to recover its share of GRI costs through the non-commodity portion of its rates. The research and development efforts of GRI have resulted in tangible results which have provided material benefits to the natural gas industry, including local distribution gas companies such as Questar.

8. Questar's application is on file with the Commission in its offices in Cheyenne, Wyoming, and at the Company's offices located in Salt Lake City, Utah, and

may be inspected by any interested persons during regular business hours.

9. Anyone wishing to intervene, request a hearing, file a statement or protest this application must do so on or before January 3, 2000.

10. If you wish to intervene in this matter and/or request a public hearing which you will attend and you require reasonable accommodation for a disability, please contact the Wyoming Public Service Commission at (307)777-7427 in Cheyenne, Wyoming, during regular business hours or write to them at 2515 Warren Avenue, Suite 300, Cheyenne, Wyoming 82002 to make arrangements. Communications impaired persons may also contact the Commission by accessing Wyoming Relay at 1-800-877-9965. Please mention the docket and record numbers in your communications. Please contact us as soon as possible to help us serve you better.

11. **The Commission directs that the public notice in this matter be in the following form:**

PUBLIC NOTICE

Questar Gas Company (Questar) has applied to the Wyoming Public Service Commission (PSC) for authority to pass-on, to its customers, a net wholesale gas cost increase of $850,000 per annum or $0.22309 per decatherm, with an effective date of December 1, 1999.

The current and proposed rates, per decatherm, are detailed in the following table:

ITEM	PROPOSED RATE	CURRENT RATE	DIFFERENCE
Gas Cost	$2.98580	$2.68134	$0.30446
Surcharge Adjustment	($0.02846)	$0.05291	($0.08137)
Total	$2.95734	$2.73425	$0.22309

The average residential customer may expect to incur an annual gas cost increase of $27.03 (4.2%) based on an estimated annual gas usage of 120 decatherms.

You may review Questar's application at the PSC in Cheyenne, Wyoming, or in the offices of Questar in Salt Lake City, Utah, during regular business hours.

To intervene, request a hearing, file a statement or protest this application, you must file with the Commission on or before January 3, 2000.

If you wish to participate and require reasonable accommodation for a disability, call the PSC at (307)777-7427 or write the PSC at 2515 Warren Avenue, Suite 300, Cheyenne, Wyoming 82002. Communications impaired persons may also contact the PSC through

Wyoming Relay at 1-800-877-9965.

Dated December 8, 1999.

IT IS THEREFORE ORDERED THAT:

1. Pursuant to open meeting action taken on November 30, 1999, the application of Questar Gas Company for authority to pass-on to its customers, a net wholesale gas cost increase of $850,000 per annum or $0.22309 per decatherm, be, and the same is hereby, approved, effective December 1, 1999, subject to public notice, protest, public hearing, change, possible refund with interest, and further determination by the Commission as it deems necessary.

2. This Order is effective immediately.

MADE and ENTERED at Cheyenne, Wyoming, this 8th day of December, 1999.

PUBLIC SERVICE COMMISSION OF WYOMING

STEVE ELLENBECKER, Chairman

STEVE FURTNEY, Deputy Chairman

KRISTIN H. LEE, Commissioner

PUBLIC SERVICE COMMISSION OF WYOMING OFFICIAL SEAL

(SEAL)

ATTEST:

DAVID J. LUCERO, Assistant Secretary