BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

IN THE MATTER OF THE APPLICATION OF ATMOS ENERGY CORPORATION FOR REVIEW AND ADJUSTMENT OF ITS NATURAL GAS RATES	))))	Docket No. 16-ATMG-____-RTS

DIRECT TESTIMONY OF

CHRISTIAN L. PAIGE

FOR ATMOS ENERGY CORPORATION

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FOR ATMOS ENERGY CORPORATION

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Christian (Troy) L. Paige. I am Manager, Engineering Services Colorado Kansas Division for Atmos Energy Corporation ("Atmos Energy" or the "Company"). My business address is 1555 Blake Street, Suite 400, Denver, Colorado 80202.

I. EXECUTIVE SUMMARY

Atmos Energy continuously strives to improve the safety and reliability of its pipeline system. Proactively identifying pipes where the risk of leaks developing is unacceptably high and then designing and implementing a plan to mitigate those risks are vital steps in that process. Today, Atmos Energy's Kansas system has approximately 682 miles of bare steel pipe in the ground, most of which has been in place since before the 1960s. In addition, of the early generation plastic

pipeline in Atmos Energy's Kansas system, there are approximately 109 miles of polyvinyl chloride ("PVC") and 707 miles of Aldyl-A and Century pipe. The natural gas industry has determined that these materials are inappropriate for use in the construction of natural gas distribution systems. Bare steel and early generation plastic pipes deteriorate with age and are prone to leaks and potential failure, which impacts both the safety and reliability of the pipeline system. As a result, bare steel and early generation plastic pipes currently represent the greatest threats to Atmos Energy's Kansas pipeline system and the mitigation of these threats is paramount to Atmos Energy's continued system safety and reliability.

At the current pace, replacing the entire bare steel and early generation plastic pipe infrastructure in Atmos Energy's Kansas system would take more than 187 years. Accelerated replacement of this aging pipeline infrastructure is necessary to maintain the safety and reliability of the system, given the increasing risk posed by this pipe. Such accelerated replacement of obsolete pipe is a very capital intensive undertaking. The Company believes that its proposed System Integrity Program ("SIP") is the most appropriate means to manage and fund the necessary investments to update Atmos Energy's gas distribution system and to help ensure the system remains safe and reliable for customers over the long term. The operation of the SIP is explained in the direct testimony of Company witness Gary Smith.

Utilizing the SIP, Atmos Energy is proposing to initially replace all bare steel, PVC, Aldyl-A and Century services, yard lines and mains in Atmos Energy's Kansas System over a period of 35 years. In order to prioritize these replacement projects, Atmos Energy has developed a Project Prioritization Tool whereby it can analyze,

rank and sequence the accelerated replacement based on factors that impact customers and the community. Atmos Energy is also proposing to establish a process whereby the Commission is able to review and approve proposed projects and be kept informed of final results.

While the safety and reliability of our system is a paramount goal for Atmos Energy, the Company understands the Commission's obligation to balance safety and cost. Atmos Energy believes the accelerated replacement of this aging and potentially fragile pipe over a 35 year timeframe strikes the right balance between increased safety for the community, our customers and property and ensuring rates continue to be reasonable for customers.

II. INTRODUCTION AND PURPOSE OF TESTIMONY

Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL BACKGROUND.

A. I graduated in 1997 from Oklahoma State University with a Bachelor of Science degree in Mechanical Engineering. In 2002, I earned a Master's in Business Administration degree from the University of Texas at Arlington. I began my career in May 1997 as a Development Engineer with Phillips Petroleum Company. One year later, I was promoted to Production Engineer II. From June 2000 to January 2004, I was employed as a Transmission Engineer for TXU Electric Delivery in Fort Worth, Texas. In January 2004, I began working for TXU Gas as a Senior Project Manager in the Dallas office. Atmos Energy acquired TXU Gas in October 2004, and my job title was changed to Engineer I. In that role, I designed and managed pipeline

construction projects and provided training to Atmos Energy employees on the Geographic Information System ("GIS") database. In January 2007, I moved to Denver, Colorado to support Atmos Energy in my current role as Manager, Engineering Services for the Company's Colorado Kansas Division. My resume is included as Exhibit CLP-1.

Q. WHAT ARE YOUR DUTIES IN YOUR CURRENT ROLE?

A. In my position as Manager, Engineering Services Colorado Kansas Division, I manage the Company's Design and GIS personnel. In that role, I have 13 direct reports, while I report to John Willis, Vice President of Technical Services Colorado Kansas Division. The Design team is responsible for coordinating and directing the design, development, and execution of engineering efforts to ensure natural gas availability, public safety and compliance with regulatory requirements and Company standards. The GIS team is responsible for maintaining and improving the accuracy of the GIS and the development of custom maps and drawings using computer aided design software. In addition to managing the Design and GIS personnel, I am also responsible for the records entered into the Lost and Unaccounted for Gas and the Lands Rights databases and Atmos Energy's document management system. I also assist in the development of the annual capital budget and provide technical review of projects, tools and equipment.

Q. HAVE YOU EVER SUBMITTED TESTIMONY BEFORE THE KANSAS CORPORATIONS COMMISSION ("COMMISSION")?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony in this proceeding is to describe Atmos Energy's present actions to replace non-standard and obsolete piping in the Kansas distribution system and the Company's plans to accelerate the replacement of this infrastructure. This non-standard and obsolete piping poses a long-term threat to the safety and reliability of Atmos Energy's Kansas distribution system and the current pace of replacement is insufficient to replace this pipe within a reasonable and safe timeframe. In support of the Company's efforts to expedite the replacement of this pipe, I will provide detailed information regarding our current Kansas distribution system and the steps necessary to economically and effectively remove and replace this pipe within a reasonable period. My testimony also supports the need for the SIP mechanism in order to allow for adequate recovery of the costs associated with our pipeline replacement efforts while reducing the need for frequent general rate cases. In addition, I provide a description of the capital expenditures included in the test year.

Q. ARE YOU PROVIDING ANY EXHIBITS WITH THIS TESTIMONY?

A. Yes. I am providing the following exhibits:

- Exhibit CLP-1 is my resume;
- Exhibit CLP-2 is a statewide map designating the region currently served by Atmos Energy;
- CONFIDENTIAL Exhibit CLP-3 is the Project Prioritization Tool providing a list of all the factors utilized in the analysis; and
- CONFIDENTIAL Exhibit CLP-4 is the SIP Bare Steel and Early Generation Plastic Pipe Project List.

III. SIGNIFICANCE AND PRIORITY OF SAFETY IN THE OPERATION OF THE COMPANY'S KANSAS DISTRIBUTION SYSTEM

Q. COULD YOU PLEASE DESCRIBE THE IMPORTANCE OF SAFETY TO ATMOS ENERGY IN THE OPERATION OF ITS KANSAS DISTRIBUTION SYSTEM?

A. The safety of Atmos Energy's customers, community and employees is Atmos Energy's highest priority in every jurisdiction in which it operates. Pipeline safety is an integral element of that mission. Company witness John McDill further discusses the Company's approach to pipeline safety from a policy perspective in his direct testimony. From the Company's perspective, there is no higher priority in our operations than safety. The SIP mechanism proposed by the Company in this docket is designed to serve that priority and enhance our ability to provide safe and reliable natural gas service to the public in the face of some significant pipeline replacement requirements.

IV. DESCRIPTION OF ATMOS ENERGY'S KANSAS DISTRIBUTION SYSTEM AND THE NECESSITY TO REPLACE OBSOLETE AND NON-STANDARD PIPE

Q. PLEASE PROVIDE AN OVERVIEW OF ATMOS ENERGY'S NATURAL GAS DISTRIBUTION SYSTEM IN KANSAS.

A. In Kansas, Atmos Energy provides natural gas distribution service to a large and diverse geographic region that includes many rural communities in southwestern, central, south central and southeastern Kansas, as well as Kansas City and many of its surrounding suburbs. We currently serve 107 communities and approximately 131,182 residential, commercial and industrial customers. A statewide map

illustrating the region currently served by Atmos Energy is provided as Exhibit CLP-2.

Q. PLEASE DESCRIBE THE VARIOUS PIPE MATERIALS THAT ARE UTILIZED IN ATMOS ENERGY'S KANSAS GAS DISTRIBUTION SYSTEM.

A. The U.S. Department of Transportation ("DOT") uses the following categories to classify main and service line materials: steel, ductile iron, copper/wrought iron, plastic PVC, plastic polyethylene ("PE"), plastic ABS[1], plastic other and other. Steel pipe has been used in the natural gas industry since the 1800s and the use of plastic pipes began in the 1960s. As improved materials are developed, older materials are discontinued or phased out by the industry. As a result, the Company has many miles of pipe in our distribution system in Kansas that are made of materials that are no longer used by Atmos Energy in new natural gas pipeline construction.

Steel pipe is categorized as bare steel or coated steel. In addition, each of those categories can be further broken down as cathodically protected or unprotected. The gas industry installed bare steel pipe until the mid-1950s. As technology advanced, the gas industry began to use cathodically protected steel pipe, and since 1970, cathodically protected coated steel pipe is the only steel material approved for the new installations by the DOT.[2] All of the bare steel pipe in Atmos Energy's Kansas system was installed before Atmos Energy acquired those systems from Greeley Gas Company ("Greeley Gas") in 1993 and United Cities Gas Company ("United Cities") in 1997. Bare steel pipe is the oldest pipe in Atmos Energy's

[1] Acrylonitrile butadiene styrene.

[2] 49 C.F.R. § 192.461

Kansas system. Currently there are approximately 682 miles of bare steel mains in Atmos Energy's Kansas system, approximately 13 miles of which is not cathodically protected. In addition, there are approximately 28,149 bare steel service lines, all of which are cathodically protected.

Similar to steel pipe, plastic pipe has undergone significant technological advancements over the past several decades. In Atmos Energy's Kansas system, the early generation plastic categories consist of PVC, Aldyl-A and Century pipe.

PVC pipe is an early generation of plastic pipe installed by the gas industry in the 1960s and 1970s that is no longer approved for use in the construction of natural gas mains and services. Aldyl-A and Century pipe are early generation PE pipes installed by the natural gas industry from the 1960s through the early 1980s. Technological advancements led the natural gas industry to discontinue the use of Aldyl-A and Century pipe in the 1980s and adopt the current generation of PE pipe. Like the bare steel pipe, all of the PVC, Aldyl-A and Century pipe in Atmos Energy's Kansas system today was installed prior to Atmos Energy's acquisition of the assets that make up that system. Currently, there are approximately 109 miles of PVC main and 707 miles of Aldyl-A and Century main in service in Atmos Energy's Kansas gas distribution system. There are also approximately 33,171 Aldyl-A and Century service lines.

Atmos Energy's Kansas pipeline and service line inventories by material are shown on Tables CLP-1 and CLP-2 below.

Table CLP-1 – Atmos Energy Kansas Pipeline Inventory by Material

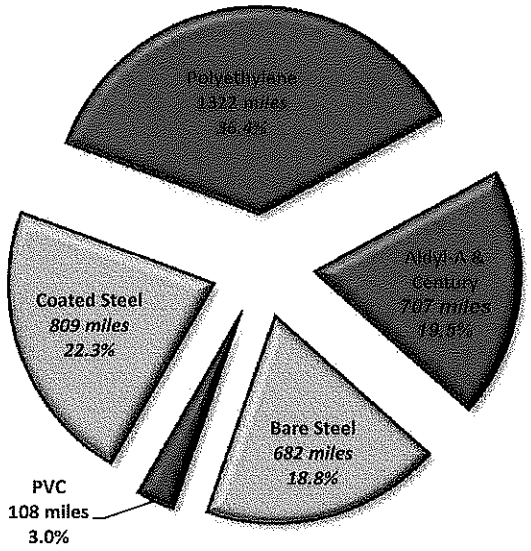
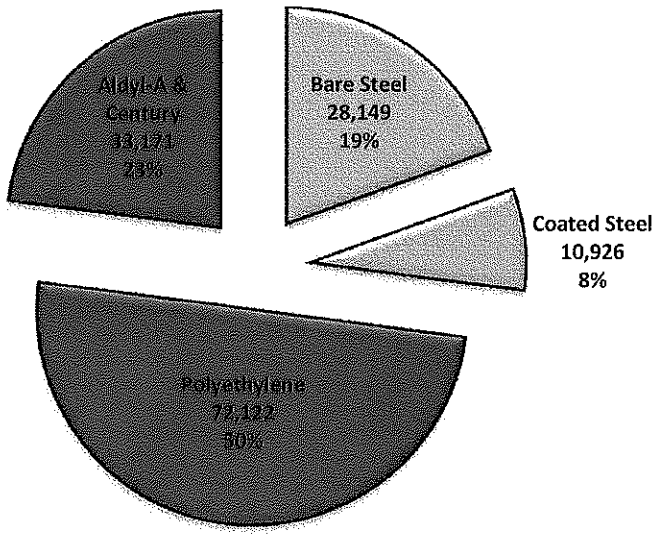


Table CLP-2 – Atmos Energy Kansas Service Line Inventory by Material



Q. WHAT IS THE SIP THAT ATMOS ENERGY IS PROPOSING IN THIS CASE?

A. In this case, Atmos Energy is requesting authority to implement a program to replace or retire all bare steel, PVC, Aldyl-A, and Century pipe over a period of 35 years. In order to recover the costs of these investments between rate cases and reduce the need for frequent general rate case filings, Atmos Energy is requesting authority to implement a SIP mechanism as further described in the direct testimony of Company witness Gary Smith. The SIP, if approved, will facilitate the complete retirement or replacement of the specific pipe materials posing an increased risk to safety and reliability because they are prone to failure over time from the threat of corrosion (for bare steel), brittle cracking (for PVC, Aldyl-A and Century), and glued coupling failure (for PVC). Atmos Energy believes the bare steel, PVC, Aldyl-A and Century services, yard lines and mains should be replaced on an accelerated basis to ensure the Company's gas distribution system remains safe and reliable.

Q. DOES ATMOS ENERGY HAVE CONCERNS REGARDING MATERIALS OTHER THAN BARE STEEL, PVC, ALDYL-A OR CENTURY POLYETHYLENE THAT SHOULD BE ADDRESSED ON AN ACCELERATED BASIS?

A. Not at this time. The Pipeline and Hazardous Materials Safety Administration ("PHMSA") issued an advisory bulletin in 2012 regarding the potential degradation of Driscopipe 8000. Atmos Energy has hundreds of miles of this type of pipe in service but has not identified any pipe segments that have experienced the degradation described in the advisory bulletin. Additionally, Atmos Energy will

continue to monitor and comply with PHMSA's Distribution Integrity Management Program rules. If Atmos Energy develops concerns about other materials, Atmos Energy will inform the Commission and make appropriate filings at that time.

A. BARE STEEL PIPELINE REPLACEMENT

Q. PLEASE PROVIDE ADDITIONAL DETAIL ABOUT ATMOS ENERGY'S PROPOSAL TO REPLACE BARE STEEL PIPE.

A. If the proposed SIP mechanism is approved, we will replace all services, yard lines and mains that are constructed of bare steel over a period of 35 years. Atmos Energy's Kansas gas distribution system still contains approximately 682 miles of bare steel pipe. The majority of the bare steel pipe in the Kansas system is at least 55 years old and some sections are approaching 75 years of service.

Q. WHAT ARE THE MAIN CAUSES OF LEAKS ON BARE STEEL PIPE?

A. The most frequent cause of leaks on bare steel pipe is corrosion. Excluding excavation damage, approximately 48% of all leaks repaired on Atmos Energy's Kansas system over the past four years were caused by corrosion.

Q. CAN CORROSION ON BARE STEEL PIPE BE EXPECTED TO CONTINUE IN THE FUTURE?

A. Yes. Once the corrosion process has started on bare steel pipe, it will continue until the pipe fails or is replaced.

Q. DOES CATHODIC PROTECTION ELIMINATE THE DETERIORATION OF BARE STEEL PIPE?

A. No. Cathodic protection is a technique used to control the corrosion rate of a metal surface. Properly applied cathodic protection reduces the rate of corrosion, but does not eliminate corrosion from occurring.

Q. WHY IS THAT A CONCERN?

A. The majority of the 682 miles of Atmos Energy's bare steel pipe has been in the ground since before the 1960s. As the 682 miles of bare steel pipe continues to age, it deteriorates and develops leaks. Allowing bare steel pipe to remain in the ground increases the risk to public safety and the reliability of our system.

Q. ARE YOU AWARE OF ANY EMPIRICAL EVIDENCE SUPPORTING THE NEED TO REPLACE ATMOS ENERGY'S BARE STEEL PIPE IN KANSAS?

A. Yes. The number of known system leaks scheduled for repair reported in the annual DOT reports has increased from 335 in 2011 to 560 in 2014. As stated earlier in my testimony, corrosion was the single largest cause of the leaks that were repaired for this same time period. The KCC report dated February 2, 2015 found that despite the fact that Atmos Energy has replaced approximately 400 service lines per year between 2004 and 2013, the leak inventory had increased. It also concluded that, "The increasing leakage trend could be an indication the effects of corrosion are outpacing the replacement plan."

Q. WHAT TYPES OF MATERIALS WILL ATMOS ENERGY USE TO REPLACE THE BARE STEEL PIPE?

A. Depending on the system maximum allowable operating pressure, Atmos Energy will replace the bare steel pipe with either PE or coated steel pipe.

Q. WHAT IS THE COST FOR THE PROPOSED REPLACEMENT OF THE BARE STEEL PIPE?

A. Company witness Gary Smith discusses the cost estimate to replace the proposed obsolete materials over the next 35 years in his direct testimony.

B. PVC, ALDYL-A AND CENTURY PIPE REPLACEMENT

Q. PLEASE PROVIDE ADDITIONAL DETAIL ABOUT ATMOS ENERGY'S PVC, ALDYL-A AND CENTURY PIPE REPLACEMENT EFFORTS.

A. Utilizing the proposed SIP, the Company will replace all services, yard lines and mains that are constructed of PVC, Aldyl-A or Century pipe over a period of 35 years. Atmos Energy's Kansas gas distribution system still contains approximately 109 miles of PVC pipe and 707 miles of Aldyl-A and Century pipe. While these pipes are not generally as old as the bare steel pipe in Atmos Energy's Kansas distribution system, they are nonetheless made of materials that are considered obsolete and no longer used in the natural gas industry.

Q. WHAT ARE THE MAIN CAUSES OF LEAKS ON PVC, ALDYL-A AND CENTURY PIPE?

A. As these materials age, the structure of the pipe weakens, becomes brittle and eventually cracks. Also, the glue used in the couplings that hold the joints of PVC together stiffens as it ages, which can result in the pipe separating from the coupling.

Q. IS REPLACEMENT OF THIS PIPE THE ONLY POSSIBLE REMEDY?

A. Yes, replacement is the only remedy for these pipes. As stated above, PVC, Aldyl-A and Century pipe are no longer materials that are used for new installations. There is

no remedial action that will reverse the brittleness or cracking of this early generation plastic pipe.

Q. WHAT TYPES OF MATERIALS WILL ATMOS ENERGY USE TO REPLACE THESE PIPES?

A. Atmos Energy will replace these obsolete pipes with current generation PE pipe.

Q. WHAT IS THE COST FOR THE PROPOSED REPLACEMENT OF THE OBSOLETE PVC, ALDYL-A AND CENTURY PIPE?

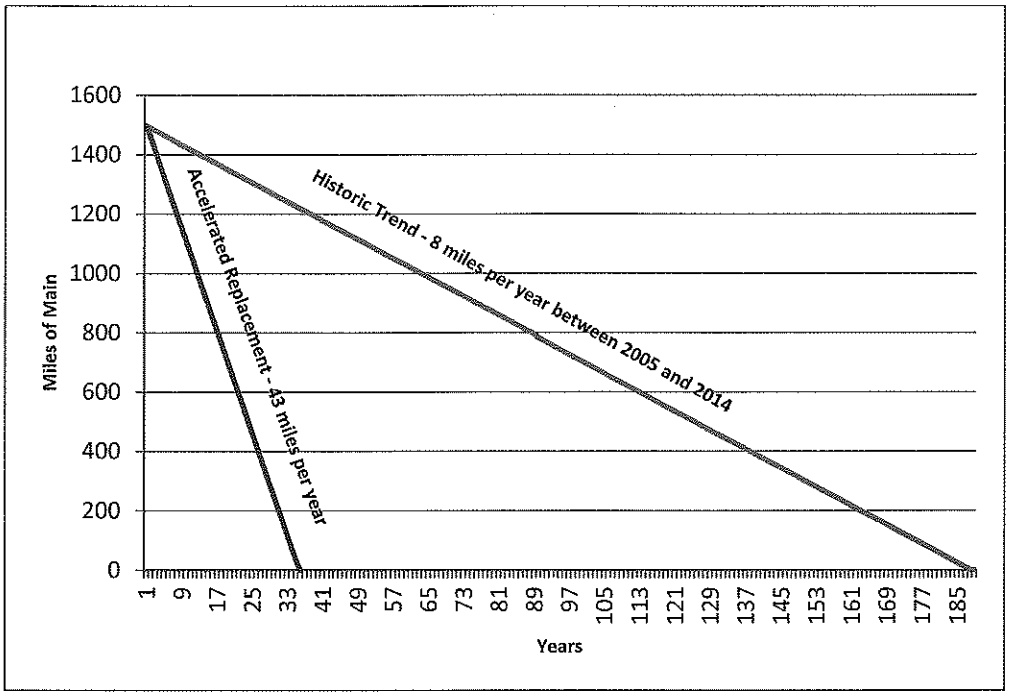
A. Company witness Gary Smith discusses the cost estimate to replace the proposed obsolete materials over the next 35 years in his direct testimony.

C. THE BENEFITS OF ACCELERATED PIPELINE REPLACEMENT

Q. BASED ON HISTORICAL SPENDING TRENDS, HOW LONG WILL IT TAKE TO REPLACE ALL OF THE BARE STEEL, PVC, ALDYL-A AND CENTURY PIPE IN KANSAS IF THE REPLACEMENT IS NOT ACCELERATED?

A. Based on replacement trends from 2005 through 2014, it will take over 187 years to replace all bare steel, PVC, Aldyl-A, and Century services, yard lines, and mains in Kansas if the replacement process is not accelerated. See Table CLP-3.

Table CLP-3 – Replacement of Bare Steel, PVC, Aldyl-A & Century Pipe



Q. WHY IS THE ACCELERATED REPLACEMENT OF THESE PIPELINES APPROPRIATE?

A. With the accelerated replacement of bare steel, PVC, Aldyl-A and Century pipe, Atmos Energy seeks to reduce the risk to persons and property associated with the potential failure of these obsolete service lines, yard lines and mains. As discussed in the direct testimony of Company witness John McDill, it is both reasonable and prudent for the Company to pursue the accelerated replacement of pipe comprised of materials with known and documented risks. It is particularly reasonable given the upward trend in leak detection experienced on Atmos Energy's Kansas facilities over the last few years. Replacement of these pipes allows Atmos Energy to mitigate the risk of incidents that can result in death, injury, or significant property damage. It

would be in the public interest to allow Atmos Energy to utilize the SIP to accelerate the replacement of pipes constructed of these types of materials.

Q. ULTIMATELY, WHAT ARE THE BENEFITS TO CUSTOMERS OF THE ACCELERATED REPLACEMENT OF THE BARE STEEL, PVC, ALDYL-A AND CENTURY PIPES?

A. Accelerated replacement of these obsolete pipes will improve system safety and reliability. Importantly, the new pipe will have the accurate, verifiable, and complete records required by federal regulation in order to perform more thorough risk assessments of the Kansas distribution system in the future. Certain technical records for parts of the Kansas distribution systems are unusable or unavailable today because they were of poor quality or nonexistent during the time that the systems were operated by the predecessor companies. Part 192 regulations[3] require that data be gathered during new pipe installations and when existing facilities are exposed during routine maintenance in order to enhance our knowledge and analyses of our systems. Therefore, an ancillary benefit of the SIP mechanism is establishing accurate pipe and component data during pipe replacement activities and then storing that information in the GIS and asset management databases to enable better risk assessments in the future.

The proposed accelerated replacement program will also reduce the inconvenience to the public by taking a proactive approach to project identification and execution rather than a reactive approach. Historically, many projects are identified and executed to eliminate an immediate hazardous threat to public safety

[3] 49 C.F.R. Part 192.

and customer reliability. Since our concern is typically a single immediate threat, we often narrowly define the project scope to quickly eliminate only that threat. This narrow approach necessitated by the immediate hazardous threat approach can lead to missed opportunities for efficiency by expanding the scope of a retirement or replacement project to include adjacent facilities that do not yet pose an immediate threat but nevertheless pose risks to the system. The SIP mechanism will facilitate Atmos Energy's replacement of bare steel, PVC, Aldyl-A and Century pipe in an area prior to the detection of an immediate hazardous threat so each project can be more efficient in both size and scope.

Q. UNDER THIS PROGRAM, WILL REPLACEMENT OCCUR WITH THE SAME SIZED PIPE?

A. Typically yes, if the existing pipe size is consistent with Atmos Energy's material standards in effect at the time of the replacement. However, if the existing pipe size is no longer an approved standard size, the Company will install the standard size that is the next larger size to the pipe being replaced.

V. ATMOS ENERGY'S PROPOSED PIPE ANALYSIS AND PRIORITIZATION SYSTEM

Q. HOW HAS ATMOS ENERGY HISTORICALLY PRIORITIZED THE WORK THAT MUST BE COMPLETED ON ITS SYSTEM?

A. Historically, highest priority has been given to reactive projects necessary to eliminate an immediate hazardous threat to public safety and customer reliability. An example of this is a Grade 1 leak, as defined by the American Gas Association's Gas Piping Technology Committee. A Grade 1 leak is a leak that represents an existing or

probable hazard to persons or property that requires immediate repair or continuous action until the conditions are no longer hazardous. Projects that are required to comply with federal, state, and local, regulations and Atmos Energy procedures are the second highest priority. An example is a repair project for a Grade 2 leak within the time limits specified by the Commission. A Grade 2 leak is a leak that is recognized as non-hazardous at the time of detection, but scheduled for repair based on probable future hazard.

The third level of priority has been the reliance on feedback from Company Subject Matter Experts ("SMEs") to determine the scope and priority of infrastructure projects. Within the Company, SMEs include Operations, Engineering, and Compliance personnel who have broad, in-depth knowledge of our systems, design and operating practices and the regulations that are applicable to our facilities and work activities. Historically, system integrity projects that are not included in the categories described above were prioritized based on information obtained through routine operating and maintenance activities. Some of these activities included inspecting services, yard lines, and mains when they are exposed, cathodic protection and pressure monitoring, and pipeline patrols.

But, in this proceeding Atmos Energy is proposing a more proactive approach to system safety and integrity investments going forward consistent with new Federal pipeline safety and integrity regulations.

Q. PLEASE DESCRIBE THE PROACTIVE PROCESS UNDER WHICH ATMOS ENERGY WILL DETERMINE THE SELECTION AND PRIORITIZATION OF PIPE REPLACEMENT PROJECTS IN KANSAS.

A. Atmos Energy will prioritize retirement and replacement projects based generally on factors calculated using a ranking tool developed by Atmos Energy. Under this approach, the process begins with SMEs working together to develop the scope of each potential replacement project. The scope will include a detailed history of the bare steel, PVC, Aldyl-A and Century services, yard lines and mains to be replaced. The assets in these projects are then entered into the Project Prioritization Tool, which will objectively score projects across the different operating areas. The model will also take into account regulatory requirements and mandates. Projects with assets receiving a higher priority ranking score will be completed prior to those with lower priority ranking scores unless otherwise warranted by the circumstances.

Q. HOW DOES THE PROJECT PRIORITIZATION TOOL WORK?

A. SMEs are required to answer questions about each project that are related to specific factors. Each answer is assigned a point value. The maximum point total that may be assigned to each factor is 5 points. The weighted average score of the factors is calculated. This average is used as the priority score for each project. The minimum score that a project can receive is 0.26 points and the maximum is 5 points. This process allows the Company to objectively sequence the accelerated replacement of bare steel, PVC, Aldyl-A, and Century pipe based on several factors. However, a low ranking score does not mean that the pipe in question is less likely to be replaced. Rather, a low ranking score only indicates how that specific portion of pipe compares to the remaining bare steel and PVC pipe on Atmos Energy's system and when that pipe is likely to be replaced.

Q. WHAT PRIORITIZATION FACTORS WILL BE CONSIDERED WHEN RANKING THE PROJECTS?

A. As specified in the Project Prioritization Tool found in Confidential Exhibit CLP-3, the prioritization factors that will be considered include Pipe Properties, Leak History, Operating Pressure, Affected Customers, Pipeline Location, Quantity of Service Lines, Pressure Test Information, Public Improvements, Cathodic Protection Records, Response Time and Scheduled Regulatory Activity. Projects are ranked relative to each other based on the defined weight for each factor found in Confidential Exhibit CLP-3.

Q. HOW DOES PIPE PROPERTIES FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Pipe Properties defines the material properties that contribute to the risk of failure of bare steel, PVC, Aldyl-A and Century services, yard lines and mains. The focus of our pipe replacement program is to reduce risk through targeted replacement of bare steel, PVC, Aldyl-A and Century pipe because of the increased likelihood of failure. The various pipe properties that are defined through the risk factor analysis include:

- Vintage – Facilities installed prior to 1970 were not subject to the more stringent manufacturing, construction and testing requirements defined or incorporated by reference in Part 192.
- Material -- The pipe replacement program will initially emphasize replacement of bare steel, PVC, Aldyl-A and Century pipe. Since the repair options for these types of pipe are limited, they represent the highest risk. Unprotected bare steel mains that do not have cathodic protection applied to them are also high risk, but

the risk associated with this material type is less than that of PVC, Aldyl-A and Century PE. Protected bare steel mains are also less risky when compared to PVC and unprotected bare steel mains.

- Joining methods – Unrestrained mechanical couplings increase the likelihood of failure of pipe segments. Failures occur when soil around unrestrained mechanical couplings has been disturbed or when a significant change in operating pressure occurs. Oxy acetylene welds have a history of cracking and increase the likelihood of joint failures on steel pipe.
- Wall Thickness – The risk of burning a hole into the pipe wall increases when welding fittings to thin wall pipe. Burning through a line in operation during welding introduces the fuel, oxygen and ignition source that is required to cause an explosion.

Q. HOW DOES LEAK HISTORY FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Leak History examines the total number of active and repaired leaks per mile. Leakage is a lagging indicator of problems with bare steel, PVC, Aldyl-A and Century services, yard lines and mains. While active leaks pose an immediate safety risk to employees and the public, the quantity of repaired leaks may constitute a trend that demonstrates the appropriateness of replacing assets rather than repairing them.

Q. HOW DOES OPERATING PRESSURE FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. The varying operating pressures create different challenges and potential threats to public safety when the failure occurs. As a result, the scores reflect the threat dynamic

associated with the different operating pressures. Leaks occurring on pipes with increased operating pressures can result in gas migrating farther and faster than on pipes with lower operating pressures.

- Low Pressure ("LP") pipes operate at less than 1 psig and may allow water to enter the system when leaks develop. As a result, LP pipes have a higher priority ranking than Intermediate and Medium Pressure pipes because water entering the system can lead to service outages and increase the risk of internal corrosion.
- Intermediate Pressure ("IP") pipes operate at pressures between one psig and 60 psig and represent the majority of the Atmos Energy distribution system. These segments have sufficient pressure to keep water from entering the line. IP pipes are typically used in areas that are supplied by multiple feeds such as subdivisions, so service interruptions caused by pipe failures are typically limited to relatively small areas.
- Medium Pressure ("MP") pipes operate at pressures between 61 psig and 100 psig. These segments typically serve as supply lines for large areas, so failures typically cause service interruptions to more customers than a similar failure on an IP line.
- High Pressure ("HP") pipes operate at pressures greater than 100 psig. These lines typically serve entire towns or communities. In many cases, they do not have redundant feeds, so failures may cause large scale service outages. The higher operating pressure will cause more gas to escape the pipes when leaks develop, which can lead to large gas migration areas.

Q. WHAT IS CONSIDERED BY THE AFFECTED CUSTOMERS FACTOR?

A. Affected Customers considers the likelihood that a pipe failure will result in a service interruption to critical, large volume customers or a large quantity of smaller volume customers. Providing reliable service ranks second only to safety in importance to Atmos Energy and this factor ranks the ability to provide reliable service if a failure occurs.

- A one-way feed is the only supply into an area, and a failure on that pipe will result in a service outage.
- Examples of critical or large volume customers include power plants, manufacturing facilities, water treatment facilities, hospitals, schools and nursing homes.
- The total number of customers served by the pipe refers to the quantity of customers that would lose service if the pipe fails.

Q. HOW DOES PIPE LOCATION FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Pipe Location reviews the location of a pipe in relation to other structures or objects that may be damaged as the result of a pipe failure, cause damage to the pipe, or contribute to increased damage. The Pipe Location plays a key role in determining the potential consequence to the public when a failure occurs.

- The class location refers to the type and quantity of habitable structures that are within 220 yards of the pipe.
- The Potential Impact Radius is the calculated radius of a circle within which the potential failure of a pipe could have a significant impact on people or property.

- Exposed pipe sections are more susceptible to damage caused by both natural and other outside forces.
- Storm drains and other utilities installed in close proximity to natural gas facilities may create a more accessible migration path to buildings, storm sewers or other locations that increase the likelihood of damage to property or death. Similarly, pipe failure that occurs under asphalt or pavement allows for the gas to migrate to a building wall increasing the likelihood of damage to property or death.

Q. HOW DOES QUANTITY OF SERVICE LINES FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Quantity of Service Lines considers the total number of bare steel, PVC, Aldyl-A and Century service lines in the project area. Over the past four years, approximately 61% of the leaks have occurred on service lines. An area that includes a high concentration of bare steel, PVC, Aldyl-A and Century service lines introduces multiple opportunities for failures to occur.

Q. HOW DOES PRESSURE TEST INFORMATION FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Pressure Test Information considers whether complete accurate and verifiable pressure test records as required by Part 192 are available for the identified pipe segments. Pressure Test Information is used to confirm that no material defects or leaks were present at the time of installation. Documentation of an acceptable pressure test is required on all pipes installed after July 1, 1970. Supporting the maximum allowable operating pressure through documentation of an acceptable pressure test has received increased scrutiny from PHMSA in recent years.

Q. HOW DOES PUBLIC IMPROVEMENTS FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. The Public Improvements factor considers whether there is road or other utility infrastructure work scheduled in the area that will negatively impact our ability to operate, maintain or replace our facilities in the future. Examples include a moratorium on street cutting after it is repaved and installation of additional utilities that limit access to our facilities.

Q. HOW DO CATHODIC PROTECTION RECORDS FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. The Cathodic Protection ("CP") Records factor considers the impact of records detailing when CP was applied to steel pipe. Unprotected bare steel pipe is more at risk for corrosion-related failures than cathodically protected bare steel pipe. This risk decreases as the CP application date approaches the pipeline installation date. Effective cathodic protection is directly related to managing failures due to corrosion.

Q. HOW DOES RESPONSE TIME FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Response Time considers the time necessary for first responders and construction crews to respond to pipe failures when they occur in remote locations. Longer response times expose the public to greater risk since the repair process does not begin until Atmos Energy employees arrive on the scene.

Q. HOW DOES SCHEDULED REGULATORY ACTIVITY FACTOR INTO ATMOS ENERGY'S ANALYSIS?

A. Scheduled Regulatory Activity takes into consideration any pending work orders that are scheduled to meet regulatory requirements such as addressing an active leak, generalized corrosion or cathodic protection deficiency. As detailed in Confidential Exhibit CLP-3, if this priority factor is initiated, it would result in an unweighted priority score of 5 and automatically moves a project to the top of the ranking to ensure that work is done in a timeframe consistent with regulatory requirements.

Q. DO ALL OF THE FACTORS RECEIVE EQUAL CONSIDERATION?

A. No. With the exception of Scheduled Regulatory Activity, each factor is weighted to reflect its influence on the safety and reliability of the natural gas distribution system. The weights are assigned based on the feedback from SMEs. A complete listing of the weights assigned to each factor can be found in Confidential Exhibit CLP-3.

Q. IS THE PRIORITY RANKING SCORE ASSIGNED TO EACH PROJECT STATIC?

A. Not necessarily. Projects that will not be completed in the current year will be reassessed annually. The reassessment may cause the priority ranking score to change. Confidential Exhibit CLP-4 provides the bare steel, PVC, Aldyl-A and Century Project List for which Atmos Energy currently has data and has utilized the Project Prioritization Tool. The list will be expanded as additional information is analyzed. As detailed in Confidential Exhibit CLP-4, the lowest priority ranking score has a priority factor of 1.546.

Q. WHAT OUTSIDE FACTORS COULD CAUSE A PROJECT WITH A LOWER PRIORITY RANKING SCORE TO BE COMPLETED BEFORE A PROJECT WITH A HIGHER SCORE?

A. As noted above, if it is discovered that a particular segment needs to be replaced within a particular timeframe due to regulatory requirements or mandates, that circumstance will override the ranking and move the project up to the top of the list regardless of its priority ranking score. Also, a project with a lower priority ranking score may be completed before a project with a higher priority ranking score if those assets must be relocated because of a scheduled DOT, city or county infrastructure improvement project. Finally, a pipe replacement project scheduled to be completed during a construction moratorium period imposed by a city after a road has been resurfaced could be deferred for a future year. This is not meant to be an exhaustive list of all factors that could cause a project with a lower priority ranking score to be completed before a project with a higher score, but rather to describe the types of outside factors or similar issues that could impact the priority score analysis.

Q. PLEASE DESCRIBE THE BENEFITS OF UTILIZING THE PRIORITY BASED REPLACEMENT APPROACH.

A. This approach will allow Atmos Energy to objectively prioritize replacement projects based on a common set of factors. Projects will be ranked solely on their merits rather than how well the project sponsors promote the projects. It will also allow Atmos Energy to ensure that the Company completes projects with the largest impact on improving the overall condition of its distribution system first. We will be able to see the influence each year as the average combined score for all projects declines. Finally, this methodology provides the Commission and other parties with the ability to audit Atmos Energy's performance under the accelerated replacement program to ensure the projects are being appropriately prioritized and completed.

Q. HOW DOES ATMOS ENERGY PROPOSE TO MANAGE THE PIPE REPLACEMENT PROJECTS TO ENSURE THAT THE COSTS ULTIMATELY PAID BY CUSTOMERS ARE REASONABLE?

A. Atmos Energy will prioritize potential pipeline projects using the Project Prioritization Tool discussed above, issue a request for proposal ("RFP") for prospective bidders and then retain the appropriate contractor to construct the project. Atmos Energy will manage the budget and project appropriately and provide construction inspection services to insure that the facilities are installed according to plan and in compliance with all applicable standards, laws and regulations. Upon completion of the project, Atmos Energy will review the project documentation to confirm that it adequately supports federal, state and Company reporting requirements.

VI. THE PROPOSED PIPE REPLACEMENT PROGRAM'S CONSISTENCY WITH STAFF'S RECOMMENDATIONS ON PIPELINE REPLACEMENT ACTIVITIES BY KANSAS LDCS.

Q. DOES ATMOS ENERGY CURRENTLY UTILIZE THE GSRS MECHANISM IN KANSAS?

A. Yes.

Q. WHY IS THE GSRS MECHANISM NOT SUFFICIENT TO FUND AN ACCELERATION OF ATMOS ENERGY'S PIPELINE REPLACEMENT ACTIVITIES?

A. As Commission Staff notes in its memorandum recommending the commencement of a generic investigation into pipeline replacement mechanisms in Docket No. 15-

GIMG-343-GIG, the application of the GSRS mechanism is severely limited in both time and scope and is not able to support the accelerated pipeline replacement program necessary to assure the continuing safe and reliable operation of natural gas distribution systems within the State of Kansas. Company witness Gary Smith further discusses why the GSRS is not sufficient to fund an acceleration of the Company's pipe replacement activities.

Q. ARE ATMOS ENERGY'S PROPOSED PIPELINE REPLACEMENT PROGRAM AND SIP MECHANISM CONSISTENT WITH STAFF'S APPROACH TO PIPELINE REPLACEMENT?

A. Yes. Staff's rationale for suggesting a generic investigation into accelerated pipeline replacement programs, as reflected on pages 3-5 of its memorandum, is consistent with both Atmos Energy's conclusions regarding the need to accelerate its pipe replacement activities and the parameters of such acceleration proposed in this proceeding. Atmos Energy's proposals are also well crafted to respond to each of the specific "Program Parameters/Qualifications for Aging Infrastructure Investment Plans" attached as ATTACHMENT 1 to Staff's memorandum.

Q. CAN YOU ELABORATE PLEASE?

A. Yes. ATTACHMENT 1 to Staff's memorandum identifies 11 parameters/qualifications that Staff recommends be addressed by an appropriately designed "Aging Infrastructure Investment Plan." These parameters (without the corresponding Staff comments) are as follows:

1. Should initial filings be limited to five year programs on a pilot basis which will be reevaluated every five years?

2. Should filings be limited to utility-specific programs[s] to replace obsolete infrastructure on an expedited basis compared to the current pace?

3. For the initial filing, should the proposed programs include a long term plan to eliminate all types of undesirable pipe in the utility's system over a pre-determined time frame (not necessarily 5 years)?

4. Should the programs be required to include a prioritization scheme for pipe replacement that reduces threats to pipeline safety?

5. Should the proposed programs be required to result in an increase in overall capital expenditures for the replacement of aging natural gas infrastructure in Kansas?

6. Should initial filings be required to include projected yearly replacement levels and capital expenditures (both in aggregate and on a per-unit basis)?

7. Should the utility be required to file annual compliance filings detailing progress made in the last year, deviation from initial projections, and revisions to remaining plan projections, if applicable?

8. Should a filing requesting an alternate ratemaking mechanism include an agreement from the utility to not file a rate case more often than once every three years?

9. Should a utility applying for the alternative ratemaking treatment be required to commit to tracking directly identifiable reductions in operating and maintenance expense? Furthermore, should any reductions in operations and maintenance expenses be used to offset the increased revenue requirements associated with the replacement program?

10. Please provide comments on the viability of Staff's proposal that utilities applying for alternative ratemaking treatment be limited to one of two non-traditional ratemaking methodologies: a Deferred Cost Recovery option or a Yearly Surcharge option.

11. Please provide a synopsis of other alternative ratemaking methodologies that you wish the Commission to consider.

Q. DOES ATMOS ENERGY'S PROPOSED SIP COMPORT WITH THESE PARAMETERS?

A. Yes. In his direct testimony, Company witness Gary Smith describes the first five years of the SIP to be a pilot program (#1). Atmos Energy's program is specifically designed to replace obsolete infrastructure on an expedited basis (#2). As is set out in my testimony above, our accelerated pipeline replacement program proposals are intended to eliminate all obsolete pipes on our system over a period of 35 years (#3). As is also discussed above, our Prioritization Tool is specifically designed to sequence the replacement projects based on the threats to the pipe and public safety (#4). The SIP will increase the average quantity of bare steel, PVC, Aldyl-A and Century pipe that Atmos Energy will replace each year from approximately eight miles to approximately 43 miles. The increased activity will result in corresponding increases in capital expenditures each year (#5). Atmos Energy also intends to provide transparency with respect to the operation of its SIP as described in the direct testimony of Company witness Gary Smith (#6 & #7). While Atmos Energy has not specifically proposed to commit to not filing rate cases at any specific interval, the SIP mechanism (along with the Company's proposed Annual Review Mechanism

("ARM")) will significantly reduce the need to file frequent rate cases when the replacement activity increases (#8). The direct testimony of Company witness Gary Smith describes the financial benefits of the SIP (#9).

Q. IS THE SIP CONSISTENT WITH STAFF'S PARAMETERS 10 AND 11?

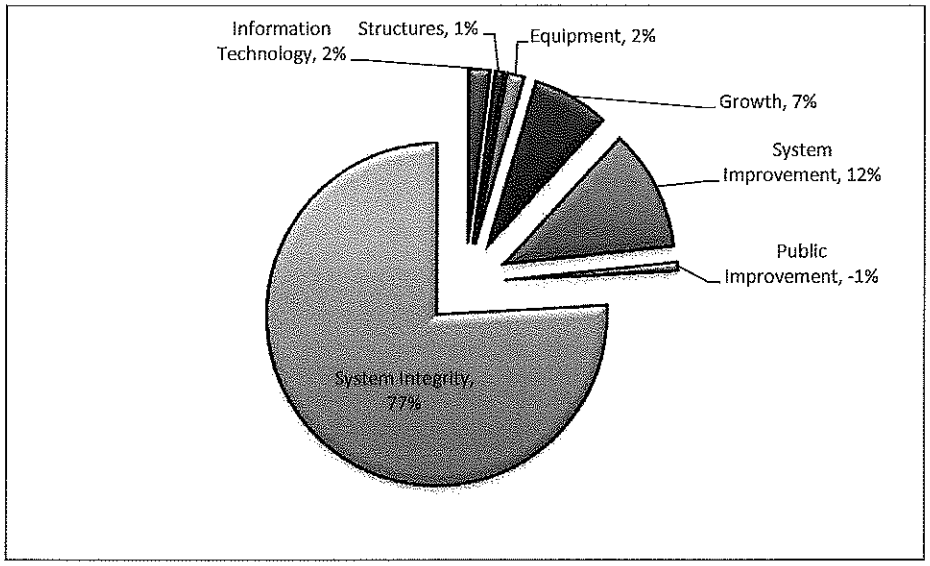
A. Yes. The direct testimony of Company witness Gary Smith describes the alternative ratemaking methodology.

VII. CAPITAL EXPENDITURES FOR THE TEST YEAR

Q. W HAT IS INCLUDED FOR CAPITAL SPENDING IN THIS RATE CASE?

A. The capital expenditures incorporated in the test year, as adjusted for known and measurable changes, include a variety of projects undertaken by the Company for the benefit of our customers. As broken out in Table CLP-4, these projects are associated with growth, equipment, information technology, structures, system improvements, public improvements and system integrity.

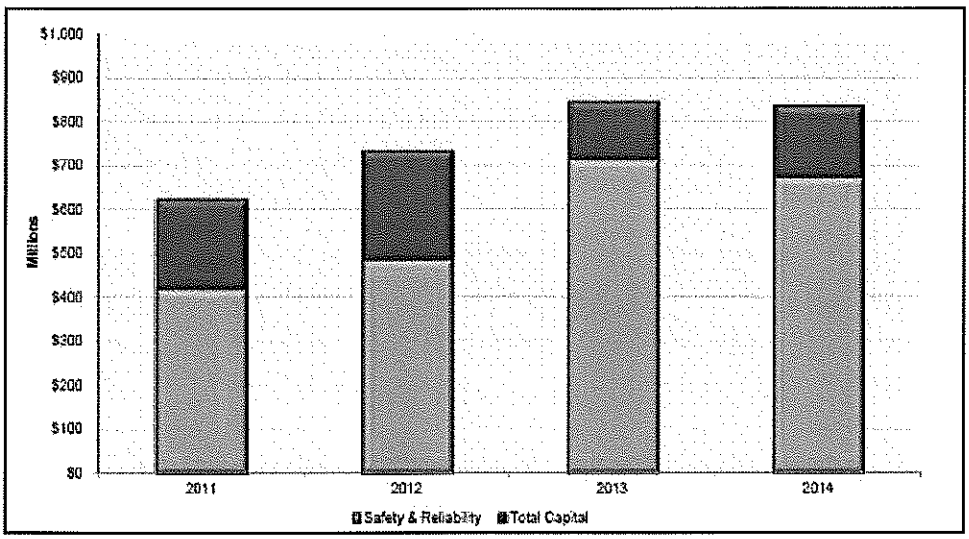
Table CLP-4 – Kansas Test Year Capital Spending



Q. IS THE FOCUS ON SAFETY AND RELIABILITY SPENDING IN THE TEST YEAR CONSISTENT WITH ATMOS ENERGY'S CAPITAL SPENDING ACROSS ITS SYSTEM?

A. Yes. As shown in Table CLP-5 below, Atmos Energy across its service territories has increased its capital spending significantly since 2011 driven largely by an increased focus on safety and reliability investments.

Table CLP-5 – Atmos Energy Total Company Capital Spending (2011-2014)



Q. PLEASE DESCRIBE THE GROWTH PROJECTS INCLUDED IN THE TEST YEAR.

A. Growth projects included service line functionals, residential meter loop and regulator functionals, commercial meter loop and regulator functionals, and main extensions to serve new subdivisions, commercial customers, and industrial customers. The expenditures for these projects were partially offset by mainline extension forfeitures.

Q. PLEASE DESCRIBE THE EQUIPMENT EXPENDITURES MADE BY THE COMPANY IN THE TEST YEAR.

A. The equipment purchases included gauges, tapping equipment, boring bits, a trailer, leak detection equipment, pipe locators, emergency trailer equipment, excavation equipment, digital recorders, and fusion equipment for installing PE pipe.

Q. PLEASE DESCRIBE THE COMPANY'S INFORMATION TECHNOLOGY EXPENDITURES.

A. The information technology expenditures included rugged laptops for field employees, network equipment, communications equipment, software, a copier, and computer replacements.

Q. PLEASE DESCRIBE THE COMPANY'S STRUCTURES EXPENDITURES.

A. Office space was added to the service center in Independence, Kansas to accommodate the Project Specialist and Operations Supervisor positions.

Q. PLEASE DESCRIBE THE SYSTEM IMPROVEMENTS EXPENDITURES.

A. There were 12 projects completed to install emergency valves, one project completed to eliminate a master meter system, and seven projects to provide additional pressure support for several distribution systems. The Company also installed automated meter reading equipment at various locations across the state, and upgraded equipment at the Liberty Storage facility.

Q. PLEASE DESCRIBE THE PUBLIC IMPROVEMENTS EXPENDITURES MADE IN THE TEST YEAR.

A. There were 14 projects to relocate gas facilities that were in conflict with city and state road relocation projects. The Company was required to relocate a main and service line in Syracuse, Kansas to accommodate a gym construction project by the Syracuse School District in Syracuse, Kansas. Atmos Energy was required to install new measurement facilities to supply the 4 Counties Co-Op gas facilities in southwestern Kansas. The credit balance of the public improvement projects was the result of a reimbursement received during the test year for invoices that were paid prior to the start of the test year.

Q. FINALLY, PLEASE DESCRIBE THE SYSTEM INTEGRITY EXPENDITURES.

A. System integrity projects included functionals for the following categories; meter loops & regulators, mains and services. The specific projects included measurement, cathodic protection, and odorization equipment. Several pipe replacement projects were completed to eliminate leaking or exposed mains, services, and yard lines.

Q. WERE THESE INVESTMENTS MADE TO SERVE CUSTOMERS?

A. Yes. These investments were made to provide service to Atmos Energy's Kansas customers and are therefore used and useful for our customers.

Q. WAS ATMOS ENERGY PRUDENT IN MANAGING THESE PROJECTS TO BE AS COST EFFECTIVE AS POSSIBLE?

A. Yes. Atmos Energy is committed to managing its projects and acting prudently so that the ultimate cost to the consumer is just and reasonable. Keeping an eye on the bottom line is a critical part of what I do every day.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

VERIFICATION

STATE OF COLORADO)
)
COUNTY OF DENVER)

Christian L. Paige, being duly sworn upon his oath, deposes and states that he is Manager of Engineering Services of Atmos Energy Corporation's Colorado-Kansas Division; that he has read and is familiar with the foregoing Direct Testimony filed herewith; and that the statements made therein are true to the best of his knowledge, information and belief.

Christian L. Paige

Subscribed and sworn before me this 21st day of July, 2015.

Notary Public

My appointment expires: 11/18/18

CAMILLE R. PARKER
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 20064045424
MY COMMISSION EXPIRES NOVEMBER 18, 2018

CHRISTIAN (TROY) L. PAIGE

17751 E. Maplewood Circle, Aurora, CO 80016
(303) 325-6793
E-mail: troy.paige@atmosenergy.com

Objective

To assist the organization achieve its vision by providing excellent customer service, and strengthening the culture based on our corporate values

Certifications/ Licenses

Licensed Professional Engineer in Texas

Skills Summary

Microsoft Office, AUTOCAD Map 2013, Smallworld Gas Distribution Office, Field Smart View, GASCALC, Pipeline Toolbox, Stoner, ACE, Oracle Projects, Power Plant, MEOS

Professional Organizations

AGA (Past Chair of the Distribution and Transmission Engineering Committee), Atmos Energy Engineering Committee (Past Chair) Atmos Energy Technology Committee, Atmos Energy GIS Steering Committee, Atmos Energy Material Standards Committee, Atmos Energy Engineering and Operations System Strategy Team (Team Lead)

Civic Organizations

Alpha Phi Alpha, Arapahoe Youth League,

Education

MBA, 2002
University of Texas at Arlington, Arlington, TX

Bachelor of Science, Mechanical Engineering, 1997
Oklahoma State University, Stillwater, OK

Experience

01/07 - Present

Manager, Engineering Services Colorado Kansas Division
Atmos Energy, Denver, CO

- Manage Design and GIS personnel
- Manage the records entered into the GIS and document management system
- Provide technical review of projects, tools, and equipment
- Assist in the annual development of capital budget
- Develop and maintain division storm water management plans
- Recommend system enhancements for the enterprise GIS

01/04 - 01/07

Engineer I
Atmos Energy, Dallas, TX

- Managed $1 million Line V Slug Catcher Installation Project
- Designed high pressure natural gas transmission pipelines
- Designed high, intermediate, and low pressure natural gas distribution lines

- Designed regulator, and measurement stations
- Managed construction projects, responsibilities included: cost estimates, permitting, scheduling, and interaction with customers
- Assigned and managed construction projects designed by engineering consulting firms
- Supported field operations as needed.
- Provided GIS training to Atmos employees

6/00 - 01/04 **Transmission Engineer**
TXU Electric Delivery, Fort Worth, TX

- Designed 69 kV, 138 kV, and 345 kV overhead and underground transmission lines
- Designed and installed interconnections with co-ops and other transmission customers
- Managed transmission line construction projects, responsibilities included: cost estimates, permitting, bid preparation, material procurement, and scheduling
- Assisted with routing of new transmission lines

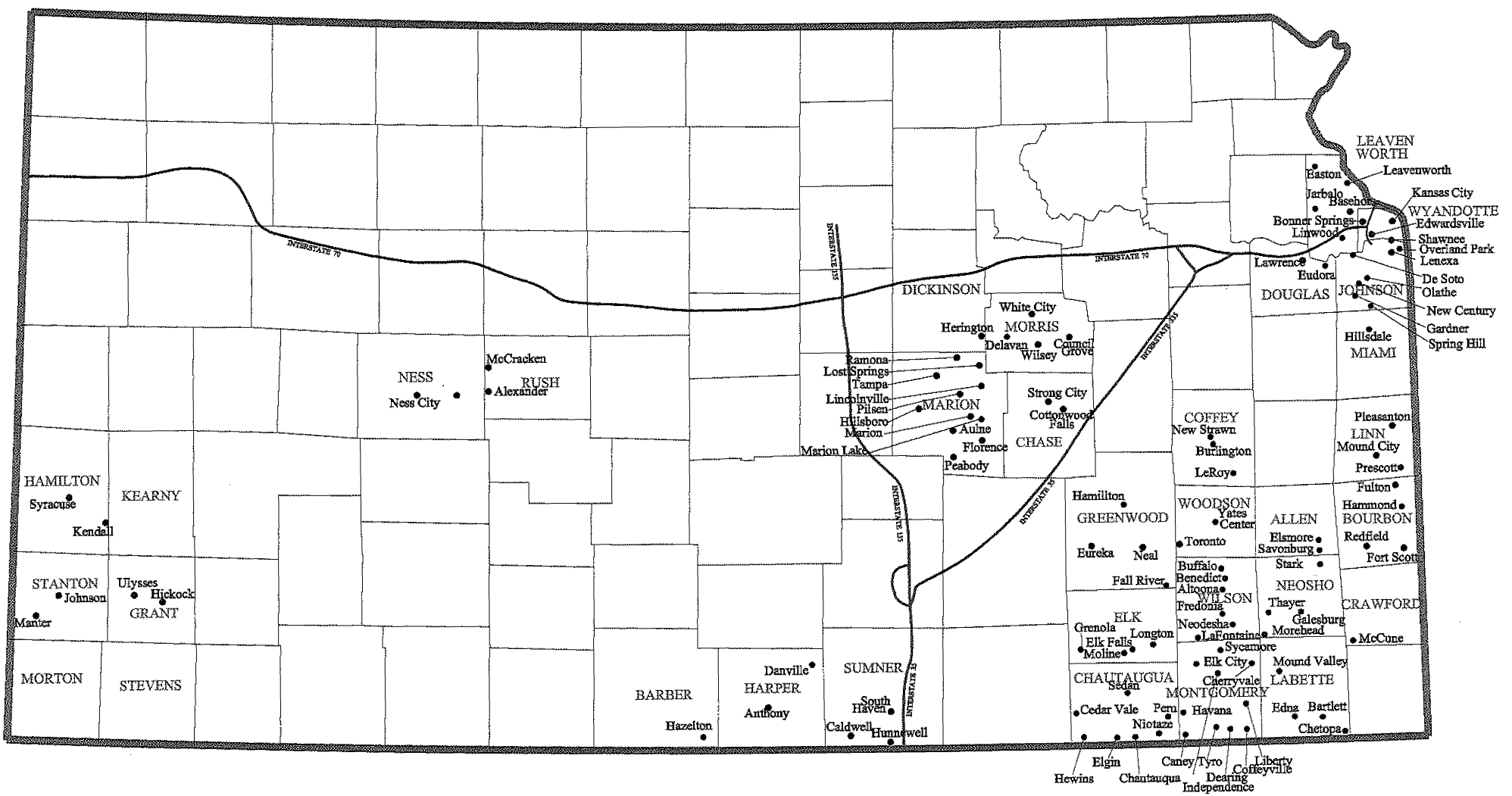
5/98-6/00 **Production Engineer II**
Phillips Petroleum Company, Odessa, TX

- Developed and managed stimulation, and workover operations for the Goldsmith Sub-district
- Created and maintained $5.4 million expense budget.
- Created annual production forecasts for oil and gas leases in the Goldsmith subdistrct.
- Evaluated waterflood performance of North Penwell Unit, Clyde Cowden Unit, and Goldsmith Andector Unit
- Designed surface and down-hole equipment

5/97-5/98 **Development Engineer**
Phillips Petroleum Company, Odessa, TX

References Furnished upon request

Exhibit CLP-2



CONFIDENTIAL

Exhibit CLP-3

Prioritization Factors

Prioritization Factor	Weight	Questions	Answers	Score

Prioritization Factors

Prioritization Factor	Weight	Questions	Answers	Score

Prioritization Factors

Prioritization Factor	Weight	Questions	Answers	Score

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Exhibit CLP-4

Kansas SIP Bare Steel and Early Generation Plastic Pipe Project List

Town	Project Title	Description	Prioritization Score	Cost

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Exhibit CLP-4

Kansas SIP Bare Steel and Early Generation Plastic Pipe Project List

Town	Project Title	Description	Prioritization Score	Cost

CONFIDENTIAL

Exhibit CLP-4

Kansas SIP Bare Steel and Early Generation Plastic Pipe Project List

Town	Project Title	Description	Prioritization Score	Cost