Issue:	**Safety Basis for Replacement Programs**
Witness:	**Timothy Goodson**
Type of Exhibit:	**Direct Testimony**
Sponsoring Party:	**Spire Missouri Inc.**
Case Nos.:	**GO-2020-0229 and GO-2020-0230**
Date Prepared:	**February 3, 2020**

SPIRE MISSOURI INC.

File Nos.

DIRECT TESTIMONY

OF

TIMOTHY H. GOODSON

February 2020

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DIRECT TESTIMONY OF TIM GOODSON

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Timothy Goodson, and my business address is 700 Market Street, St. Louis, Missouri, 63101.

Q. WHAT IS YOUR PRESENT POSITION?

A. I am presently employed by Spire Missouri ("Spire Missouri" or "Company") as Vice President – Field Operations.

Q. PLEASE STATE HOW LONG YOU HAVE HELD YOUR POSITION AND BRIEFLY DESCRIBE YOUR RESPONSIBILITIES.

A. I was appointed to my current position on April 15, 2015. In this capacity, I oversee various operational functions for the Company, including Service, Distribution Maintenance, Distribution Construction, and Pipeline Management.

Q. PLEASE DESCRIBE YOUR EXPERIENCE WITH SPIRE MISSOURI PRIOR TO ASSUMING YOUR CURRENT POSITION.

A. I have been continuously employed by Spire Missouri since May 2013. Prior to my current position, I held a variety of positions in the Energy and Chemical industries.

Q. WHAT OTHER EXPERIENCE DO YOU HAVE WITH REGARDS TO PIPELINE OPERATIONS AND SAFETY?

A. I am a current member of the Operating Section Committee for the American Gas Association. I have constructed and operated natural gas storage and pipelines, measurement and interchange stations, and gas compressor stations.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I received a Bachelor of Science Degree in 1976 from the Clemson University and a Master of Science Degree from the University of South Carolina in 1980.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION ("THE COMMISSION")?

A. No, I have not.

PURPOSE OF TESTIMONY

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

A. The purpose of my direct testimony is to provide a "level-set" on the Infrastructure System Replacement Surcharge ("ISRS") mechanism and Spire's recent ISRS cycle proceedings. I will provide summary information on the additional evidence Spire has submitted in its recent ISRS filings; evidence supporting the strategic cast iron and bare steel replacement programs underlying the Company's ISRS applications. I will also explain why it is not only appropriate, but necessary, that the Commission continue its support of replacing aging cast iron and bare steel infrastructure as a way to enhance the safety of the Company's customers by improving the integrity of the Company's gas delivery system.

ISRS MECHANISM

Q. WILL YOU PLEASE DESCRIBE, IN GENERAL TERMS, THE ISRS MECHANISM.

A. In 2003, the Missouri legislature enacted the ISRS statute to allow for incremental infrastructure replacement costs to be recovered by utilities more quickly and outside of a general rate case. The ISRS legislation addresses an emerging safety issue related to aging cast iron and bare steel pipes, enhances Commission oversight and transparency into our

replacement efforts, reduces the regulatory cost of frequent rate cases and ensures that utility companies are able to attract the investor capital efficiently to fund these multimillion dollar efforts.

Q. HOW HAS THE ISRS STATUTE IMPACTED SPIRE AND MISSOURI?

A. At Spire, safety is a principle value. The Company has utilized the ISRS mechanism, in tandem with the lower commodity costs we've experienced over the past decade, to accelerate the replacement of aging cast iron and bare steel infrastructure. In the 15 years since the ISRS statute was enacted, pipeline replacement in Missouri has accelerated considerably. Spire has invested more than $1 billion to replace more than 2,500 miles of aging pipeline across the state through the ISRS and has reduced the anticipated time to complete its cast iron replacement program from 80 to 100 years to approximately 25 years. Without mechanisms such as the ISRS, which ease the financial burden of deploying large amounts of capital between rate cases, this magnitude of investment would not be possible.

Q. HAS THIS SIGNIFICANT INVESTMENT IN MAKING THE COMPANY'S DISTRIBUTION SYSTEM SAFER COME AT A SIGNIFICANT COST TO CUSTOMERS?

A. No. As the Company demonstrated in its last several cases, its accelerated, systematic replacement programs have actually saved customers money compared to the costs that would be incurred under the prior "piecemeal" approach of replacing facilities only once they are leaking. Moreover, because of the significant operational efficiencies achieved by the Company from 2013 forward, as well as the impact of tax laws that became effective in 2017, the Company was actually able to make and include in base rates over $800 million in these critical safety investments while still *reducing* those base rates for its customers.

The fact that the Company has be able to procure gas supplies at very favorable prices over this same time frame has only served to further offset the impact of its safety-related investments.

POST RATE CASE ISRS FILINGS

Q. HOW MANY ISRS FILINGS HAS SPIRE MADE SINCE ITS LAST GENERAL RATE PROCEEDINGS?

A. Since the conclusion of the Spire's 2017 general rate cases, the Company has filed three semi-annual ISRS filings ("Post Rate Case ISRS Filings").

Q. HAVE THE POST RATE CASE ISRS FILINGS BEEN REPRESENTATIVE OF SPIRE'S HISTORICAL ISRS CASES?

A. Unfortunately, no, they have not. The Post Rate Case ISRS Filings have not been representative of Spire's experience with the ISRS over the past 15 years. These cases have been highly contested, fully litigated, and have involved disputes on items that have long been supported by the policies of the state of Missouri and the Missouri Public Service Commission, most notably the need to replace aging infrastructure such as cast iron and bare steel pipes, an issue Missouri has been at the forefront of addressing.

Q. EXPLAIN HOW THE COMPANY'S ISRS FILINGS AND THE REPLACEMENT OF CAST IRON AND BARE STEEL INFRASTRUCTURE ARE RELATED?

A. All of the projects and investments underlying Spire's ISRS application are driven by the Company's strategic cast iron and bare steel replacement programs. These programs are designed to comply with the Commission's rules mandating the replacement of aging cast iron and bare steel infrastructure found at 20 CSR 4240.40-030(15). These safety rules were promulgated by the Commission in 1989 after several gas explosions involving bare

steel service and yard lines; however, as acknowledged by the Commission in Case Nos. GO-2019-0115 and GO-2019-0116, Spire has been actively engaged in replacing cast iron and steel pipes since the 1950's. As discussed throughout the Post Rate Case ISRS Filings, Spire employs a systematic, neighborhood approach to conducting these programs which has resulted in improved system integrity, efficient operations and customer savings related to not only the replacements themselves, but also by reducing the ongoing maintenance needs and operating costs of the Company's distribution system.

CAST IRON AND BARE STEEL

Q. PLEASE EXPLAIN THE PROBLEMATIC CHARACTERISTICS OF CAST IRON AND BARE STEEL PIPE.

A. As supported by the record in the Post Rate Case ISRS Filings, there is no dispute among the parties or the Commission that there are clear safety-related concerns regarding aging cast iron and bare steel infrastructure. The cast iron and bare steel pipes being retired or replaced as part of Spire's ISRS projects are 60-100 years or more old, with the majority falling at the upper end of this age range. While there has certainly been an increased focus in more recent years on eliminating cast iron and bare steel pipe given some of the very serious incidents that have occurred involving such facilities, it is important to recognize that the problematic characteristics of these facilities, as outlined by the PSC in recent Orders, has been known for some time. In fact, as just mentioned Spire Missouri's predecessor, Laclede Gas Company, began replacing certain cast iron and bare steel pipes in the 1950's because of the concerns that existed even then over these characteristics.

Q. HAS THE COMMISSION ADDRESSED THE RISKS ASSOCIATED WITH CAST IRON AND BARE STEEL INFRASTRUCTURE IN THE COMPANY'S POST RATE CASE ISRS FILINGS?

A. Yes, it has. In its Report and Order's, the Commission has stated that "cast iron pipes are unsafe to use because they tend to graphitize, making the pipe brittle and subject to cracking and leaking." The Commission also acknowledged that the cast iron pipes that are being replaced are sixty to one-hundred years or more old. Regarding steel infrastructure, the Commission found that steel "that is not cathodically protected corrodes relatively quickly and needs to be replaced" as the "corrosion diminishes wall thickness which causes the possibility of leaks."

Q. AFTER CONSIDERING THESE RISKS, WHAT DID THE COMMISSION CONCLUDE REGARDING BARE STEEL AND CAST IRON PIPES?

A. The Commission has determined in each of the Post Rate Case ISRS Filings that the cast iron and bare steel pipe being replaced as part of Spire's replacement programs is in a "worn out or deteriorated state" and therefore, ISRS eligible. Spire agrees.

Q. DOES THE COMMISSION'S LANGUAGE ACCURATELY DEPICT SPIRE'S DAY TO DAY EXPERIENCE WITH AGING CAST IRON AND BARE STEEL PIPE?

A. Yes, it does. The table below provides leak and break information related to cast iron pipe for Spire's Missouri's East and West operating units for the period August through December 2019, the ISRS period included in the instant ISRS case. As illustrated in the table, during these five months, Spire East performed 171 repairs on leaks located at bell joints. Spire West performed 21 similar repairs. These figures highlight an often

overlooked, but significant concern regarding cast iron pipe, specifically, the degree to which the connectivity and joints are worn out or in deteriorated condition and no longer serve their intended purpose satisfactorily. In addition to leaks located at the joints, the table demonstrates that Spire East experienced 15 cast iron breaks and 22 corrosion related leaks during this five-month period. Spire West experienced 1 cast iron break and 24 corrosion related leaks.

Cast Iron Leak Data August 2019 - December 2019		
Bell Joint Leak Repairs	171	21
Cast Iron Breaks	15	1
Cast Iron Corrosion Leaks	22	24

Q. ARE THE COMMISSION'S CONCERNS REGARDING CAST IRON AND BARE STEEL PIPE SHARED BY FEDERAL REGULATORY ORGANIZATIONS AND THE NATURAL GAS INDUSTRY??

A. Yes. It is widely accepted by leading industry experts and organizations, as well as the scientific community, that there are significant risks associated with aging cast iron and bare steel infrastructure and that there is an acute need to implement aggressive programs to remove this pipe from service. Following several tragic incidents in 2010 and 2011, the Secretary of the Department of Transportation, Ray LaHood. sent letters to Governors of each state inviting them and others to a DOT Pipeline Safety Forum at DOT's Washington headquarters to address these issues. Spire representatives attended and participated in this forum. Similarly, a letter was sent to utility commissioners urging them to review their State's replacement plans (for cast iron and bare steel specifically) and "consider what would be necessary to accelerate these plans." (March 31, 2011 letter from Cynthia Quarterman, DOT Administrator). The stated goal of the DOT's April 2011 Pipeline Safety

Forum was "accelerating the rehabilitation, repair, and replacement of critical pipeline infrastructure with known integrity risks."

Q. PLEASE CONTINUE.

A. Also, in 2011, PHMSA issued a White Paper reviewing the programs available in various states "to support efforts to accelerate the repair, rehabilitation and replacement of high-risk infrastructure in pipeline systems…" PHMSA looked favorably upon Missouri's ISRS Statute as one of the programs available to protect the public "by ensuring the prompt rehabilitation, repair, or replacement of high-risk gas distribution infrastructure." PHMSA further urged State commissions to "accelerate the repair, rehabilitation, and replacement of high-risk pipeline infrastructure." (PHMSA White Paper, p. 17). In March 2012, PHMSA issued an Advisory Bulletin to gas operators and state pipeline safety representatives on Cast Iron Pipe. The Bulletin urged pipeline operators, like Spire Missouri, to conduct a comprehensive review of their cast iron distribution pipelines and replacement programs, and accelerate the pipeline repair, rehabilitation, and replacement of high risk pipelines. The Bulletin also requested that agencies consider enhancements to cast iron replacement plans and programs.

Q. HOW HAVE STATES AND THE NATURAL GAS INDUSTRY RESPONDED TO THESE CALLS TO ACTION?

A. According to the American Gas Association, over 40 state jurisdictions have mechanisms in place similar to Missouri's ISRS and the heightened awareness of this issue combined with effective cost recovery mechanisms has facilitated billions of dollars in utility investment in replacing aging, high risk cast iron and bare steel pipe. In the 10 years ending in 2018 (latest year reported) the Nation's cast and wrought iron inventory has been

reduced by over a third, and 22 States and 1 territory have eliminated their share. Bare steel mains and service lines have been replaced at even a slightly faster pace.

Q. HAS SPIRE PROVIDED ADDITIONAL EVIDENCE IN THE POST RATE CASE ISRS FILINGS SUPPORTING THE REPLACEMENT OF CAST IRON AND BARE STEEL PIPES?

A. Yes. In the Post Rate Case ISRS Filings, Spire has submitted the aforementioned, letters, recommendations, whitepapers, and resolutions of national organizations such as the DOT, the Pipeline Hazardous Materials and Safety Administration ("PHMSA"), and the National Association of Regulatory Utility Commissions ("NARUC") encouraging the acceleration of aging gas infrastructure replacement and the use of regulatory cost recovery mechanisms such as the ISRS as a way to facilitate such investment.

In addition, Spire has provided the expert testimony of Company and former Public Service Commission Gas Safety, Engineering, and Pipeline Management personnel with a combined experience of over a century in every facet of pipeline safety, engineering, construction, and management. These individuals have participated on a national level in addressing the risks associated with bare steel and cast-iron pipe. Spire's experts have stated affirmatively that in their many years of experience with gas distribution facilities they had never encountered a cast iron or bare steel pipe dug up that was not in some sort of deteriorated condition.

The Company has filed the recommendations of Missouri safety officials, including an April 2011 Pipeline Safety Program Report issued by this Commission, further described

below, that noted the advanced age and large quantity of cast iron and steel pipelines in the distribution systems of Missouri utilities and emphasized the need to consider accelerated programs for replacing such facilities so that they wouldn't still be in the ground 200 years after they were first installed.

Spire has facilitated pipeline replacement field visits for the Staff of the Public Service Commission and the Office of Public Counsel, giving them an up-close, first-hand look at the very cast iron pipe being replaced on the Company's distribution system.

Finally, Spire has provided pictures and additional physical specimens of typical cast iron and steel facilities dug up and removed from the ground in the recent past showing the extreme deterioration of such facilities over the many years that they had been in service.

FEDERAL AND STATE REQUIREMENTS

Q. PLEASE EXPLAIN THE FEDERAL REGULATIONS SPIRE MISSOURI IS SUBJECT TO REGARDING ITS DISTRIBUTION INFRASTRUCTURE.

A. The Natural Gas Pipeline Safety Act of 1968 authorized the Federal Department of Transportation ("DOT") to implement regulations that established pipeline safety requirements for pipeline operators that transport natural gas and other fuels. The DOT rules found at 49 Code of Federal Regulations Part 192 ("Part 192") became effective in 1971 and established minimum safety requirements for pipeline operators that operate natural gas transmission or distribution systems. These regulations established a variety of requirements related to pipeline system components. As part of the 2002 Pipeline Safety

Improvement Act, Part 192 was updated to include new requirements related to gas transmission pipelines. The 2006 Pipeline Inspection, Protection, Enforcement, and Safety Act resulted in additional changes to Part 192, including the requirement of the Company to develop and implement a Distribution Integrity Management Program ("DIMP"). Consistent with this mandate, which has been incorporated in the Commission's own safety rule, Spire Missouri's DIMP Plan identifies and prioritizes the risks to the Company's pipeline system. Cast iron and bare steel, including bare steel that was not cathodically protected until decades after installation, rank among the highest risks identified in the plan, outside of third party damage, due to the high likelihood of leaks and breaks associated with these types of pipe material. The Commission's Gas Safety Staff is responsible for enforcing these regulations.

Q. HAS THE COMMISSION ESTABLISHED RULES REGARDING THE REPLACEMENT OF CAST IRON AND STEEL PIPES?

A. Yes. As mentioned above, the Commission has determined that public safety requires replacement programs for certain facilities, most notably programs for the replacement of cast iron and unprotected steel facilities – the very programs whose costs are included in the Company's request in these proceedings. The requirement for Spire Missouri to develop and implement such replacement programs can be found at 20 CSR 4240-40.030(15)(D)&(E) of the Commission's gas safety rules – provisions that were implemented by the Commission following a number of fatal natural gas explosions that occurred in Missouri in the late 80's.

Q. ARE THERE ANY ADDITIONAL REQUIREMENTS REFLECTED IN THE COMMISSION'S GAS SAFETY RULES.

A. Additional Missouri requirements are reflected at 20 CSR 4240-40.030(17), which require that natural gas facility operators like Spire Missouri develop and implement system integrity plans. In addition to mandating that operators develop processes for assessing the risks from leaks and other failures on their system, the rules also require that they "[i]dentify and implement measures to address [such] risks" and [d]etermine and implement measures designed to reduce the risks from failure of its gas distribution pipeline." 20 CSR 4240-40.030(17)(D).4

Q. HAS THE COMMISSION ISSUED ANY PRIOR STATEMENTS REGARDING THE REPLACEMENT OF CAST IRON AND BARE STEEL INFRASTRUCTURE?

A. Yes. As mentioned above, Spire submitted as evidence a 2011 Pipeline Safety Program Report issued by the Missouri Public Service Commission in April 2011 which stated the following:

> "Review of the integrity of older cast iron and steel natural gas pipeline facilities needs to be completed with the possible goal of initiating specific long-term replacement programs to eliminate significant mileage each year. Currently, there are cast iron natural gas pipelines in service in Missouri that were installed well over 100 years ago. Two Missouri natural gas operators have a combined total of over 1,200 miles of cast iron in their distribution systems. The recommendation is for Staff to have meetings with the utilities that have these facilities and discuss the issue of systematic replacement of the aging infrastructure and the impact on rates. There are integrity issues, maintenance issues, service reliability issues and rate issues involved. The issues are related to safety, but there is also a policy decision that needs to be evaluated to determine the implications of continuing to have cast iron piping in distribution systems 30 years or 40 years from now. There should also be a discussion as to how much it will cost to initiate replacement programs for a specified number of years, and the rate implications of such programs. If the current annual replacement rate for cast iron pipelines (the average over the last three calendar years has been approximately 15 miles annually) continues, it would take over 80 years to replace the cast iron pipelines in Missouri, which could result in cast iron piping that is over 200 years old carrying natural gas. Also, older steel pipelines have been involved in the two recent incidents in Missouri. The age of

the steel pipeline, by itself, may not be a determining factor. The age, as well as other integrity factors would need to be included in the review. (Page 26)

Q. HOW DOES THE COMMISSION'S GAS SAFETY STAFF EXERCISE OVERSIGHT OF SPIRE MISSOURI'S REPLACEMENT PROGRAMS?

A. The Commission's Gas Safety Staff is continually aware of the ongoing pipe replacement work being performed by Spire Missouri. The Commission's Safety Staff is actively and routinely involved in assessing the Company's compliance with various safety requirements, including those relating to the structure and nature of its replacement programs. Among other things, these activities include multiple annual audits, the review of quarterly and annual reports prepared and submitted by the Company and, where appropriate, the submission of data requests or other requests for information. The Safety Staff is also familiar with every major incident involving the Company's facilities and will propose various measures for preventing such incidents in the future.

Q. DO THE COMPANY'S REPLACEMENT PROGRAMS, AS CURRENTLY CONDUCTED, PERMIT THE COMPANY TO COMPLY WITH THE ABOVE-MENTIONED SAFETY REQUIREMENTS IN A COST-EFFECTIVE WAY?

A. Absolutely. Our systematic replacement programs are a critical component of our compliance with these requirements to identify and implement measures to reduce the risks resulting from leaks and other potential failures of Spire Missouri's gas distribution facilities. The Company cites these programs as measures that have been taken to comply with these requirements. An evaluation of leaks and other data shows that they have been very effective in reducing the number of leaks experienced by the Company. In short, the Company's implementation of its replacement programs has permitted it to comply more

effectively with the safety requirements that are designed to protect the health and welfare of the Company's customers and the public.

Q. DO YOU HAVE ANY CONCLUDING REMARKS?

A. Yes. At Spire, the safety of our customers is paramount and our highest priority. The Company has followed the Missouri legislature and this Commission's lead on addressing the critical safety issue of cast iron and bare steel replacement. Since the inception of the ISRS, Spire has invested more than $1 billion to replace more than 2,500 miles of aging pipeline across the state through the ISRS and has reduced the anticipated time to complete its cast iron replacement program from 80 to 100 years to approximately 25 years. The Company has continued to employ best practices and pursue these replacements in a strategic, efficient manner that provides customers with not only safety benefits now, but savings and benefits that will continue long into the future. Cast iron and bare steel facilities are documented and known to be problematic and a safety issue. This can be seen at the state level coast to coast and at the Federal level. Cast Iron and bare steel by their nature are worn out or are in deteriorated condition in Missouri because of their physical characteristics coupled with their age at nearly 100 years old. The Commission's continued support of cast iron and bare steel replacement cost recovery through the ISRS is crucial to ensuring that Spire can continue its programs at its current pace and deliver these benefits to its customers.

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

A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Spire Missouri Inc. to Change its Infrastructure System Replacement Surcharge in its Spire Missouri East Service Territory	))))	**File No. GO-2020-0229**
In the Matter of the Application of Spire Missouri Inc. to Change its Infrastructure System Replacement Surcharge in its Spire Missouri West Service Territory	))))	**File No. GO-2020-0230**

AFFIDAVIT

STATE OF MISSOURI)
) SS.
COUNTY OF ST. CHARLES)

Timothy H. Goodson, of lawful age, being first duly sworn, deposes and states:

1. My name is Timothy H. Goodson. I am Vice President, Field Operations for Spire Missouri Inc. My business address is 700 Market St., St Louis, Missouri, 63101.

2. Attached hereto and made a part hereof for all purposes is my direct testimony on behalf of Spire Missouri Inc.

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

Timothy H. Goodson

Subscribed and sworn to before me this 3 day of February 2020.

Notary Public

TARA A DORTCH
Notary Public - Notary Seal
STATE OF MISSOURI
Commissioned for Saint Charles County
My Commission Expires: March 9, 2023
Commission # 15633816