BEFORE THE
NEW YORK STATE
PUBLIC SERVICE COMMISSION

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Proceeding on Motion of the Commission as to the
Rates, Charges, Rules and Regulations of
National Fuel Gas Distribution Corporation
for Gas Service

Case 16-G-0257

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REBUTTAL TESTIMONY
OF JOHN J. SPANOS

NATIONAL FUEL GAS DISTRIBUTION CORPORATION

September 16, 2016

Q. Please state your name and business address.

A. My name is John J. Spanos. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania 17011.

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

A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC as Senior Vice President.

Q. Have you previously submitted testimony in this case?

A. Yes. I provided Direct Testimony and Exhibits regarding the annual depreciation accrual rates.

Q. What is the purpose of your Rebuttal Testimony?

A. I will respond to depreciation issues proposed by the Staff Gas Panel ("Staff"). The specific issues relate to average service life and survivor curves for three accounts and the methodology used to develop the book reserve. In order to properly address these issues, I will first discuss depreciation concepts and the process of estimating service lives.

Q. Why is it important to review depreciation concepts as part of your rebuttal testimony?

A. Based on depreciation discussions in Staff's direct testimony, it is important to consider and emphasize certain fundamental depreciation concepts. In particular, it is important to highlight the

fact that the purpose of depreciation is to recover the costs of a company's assets over the actual period of time they will be in service. By allocating costs equitably over the assets' service lives, each generation of customers pays its fair share of the capital assets that provide gas service (*i.e.*, inter-generational equity). Because depreciation is a forward looking process, it necessarily involves estimates of both service lives and net salvage (net salvage is generally the cost to retire an asset). In order to provide the most equitable allocation of costs, these service life and net salvage parameters must be based on reasonable estimates that incorporate many factors, including the analysis of the Company's actual experience as well as the outlook and plans for the Company's assets (including industry paradigm changes).

Q. What is depreciation?

A. Depreciation is defined in the Federal Energy Regulatory Commission ("FERC") Uniform System of Accounts ("USOA"), which has been adopted by the Commission, as follows:

> 12. Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are

> wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities.[1]

Q. What is the objective of depreciation?

A. The objective of depreciation is to allocate, in a systematic and rational manner, the full cost of an asset (*i.e.*, original cost less net salvage) over its service life. The USOA requires this type of allocation in General Instruction 22-A:

> Method. Utilities must use a method of depreciation that allocates in a systematic and rational manner the service value[2] of depreciable property over the service life of the property.

Thus, the USOA confirms that depreciation represents the allocation of the full costs of a company's assets (original cost less any net salvage) over their service lives — that is, over the period of time the assets are providing service. Costs are allocated over the service lives of the assets so that customers pay for the costs of the assets that provide them service. Current customers should not pay for the costs of assets that have already been retired or those not yet in service. Similarly future customers should not have to pay for the costs of assets that are no longer in service because current customers pay too little for their service. By establishing

[1] 18 Code of Federal Regulations 101 (FERC USOA), Definition 12.
[2] The USOA defines service value as the original cost less net salvage.

appropriate depreciation rates, each generation pays the fair share of the cost of providing gas service.

Q. Please explain the process for estimating service lives.

A. Service lives are estimated in our depreciation study based on a number of factors, and these estimates incorporate accepted statistical techniques and proper judgment to determine the most reasonable estimates for each account. A depreciation study requires the estimation of events that will occur many years in the future. For example, the average service lives estimated for the Company's assets such as services and meters are 55 and 36 years, respectively. Many individual assets will live longer than the average. Thus, the depreciation study must predict what will occur over the next 55 years or more. There are tools available to aid in forecasting service lives, such as the statistical analyses of historical data. However, the Commission should not lose sight of the fact that depreciation is necessarily a forward looking process in which uncertain events are being forecast many years into the future.

Because depreciation is a process of forecasting the future, it is impossible to predict what will occur with 100 percent precision. The statistical tools available by definition consist of imperfect

information, because the Company's assets have only lived for a fraction of their lives. Therefore, estimation requires extrapolation and judgment, which must incorporate the knowledge and experience of the depreciation professional performing the study. For example, the curve fitting process for life analysis may result in a range of average service life estimates that could be supported by the historical data alone. The judgment of the depreciation professional making the estimate is required to differentiate between these possible estimates. Additionally, Company plans or other factors, including industry trends, may result in the future being different from the past. For this reason, service life estimates cannot be based only on statistical analyses of historical data.

Q. Do any authoritative depreciation texts support your assertion that a comprehensive depreciation study should incorporate factors other than statistical analysis?

A. Yes, all depreciation texts are clear that service life estimates are forecasts of future expectations. It is widely understood by depreciation professionals that sole reliance on the statistical analysis of historical data is inappropriate for life estimation.

As an example, the National Association of Regulatory Utility Commissioners *Public Utility Depreciation Practices, 1996,*

("NARUC Manual") is one of the most widely recognized authoritative depreciation texts. Chapter VIII of the NARUC Manual discusses life analysis.

Q. Does the NARUC Manual support that the statistical analysis should be the only factor used to estimate service lives?

A. No. To the contrary, the NARUC Manual is clear that "several factors should be considered in estimating property life. Some of these factors are:

1. Observable trends reflected in historical data;
2. Potential changes in the type of property installed;
3. Changes in the physical environment;
4. Changes in management requirements;
5. Changes in government requirements; and
6. Obsolescence due to the introduction of new technologies."[3]

Q. Does the NARUC Manual recognize the necessity of judgment in a depreciation study?

A. Yes. The NARUC Manual has an entire section dedicated to "informed judgment." NARUC defines "informed judgment" as:

> [A] term used to define the subjective portion of the

[3] *Public Utility Depreciation Practices*, NARUC, 1996, p. 129.

> depreciation study process. It is based on a combination of general experience, knowledge of the properties and a physical inspection, information gathered throughout the industry, and other factors which assist the analyst in making a knowledgeable estimate.[4]

NARUC also notes that "the use of informed judgment can be a major factor in forecasting" and explains that "[t]he analyst's judgment, comprised of a combination of experience and knowledge, will determine the most reasonable estimate."[5]

Q. Are Staff's recommendations set forth in its direct testimony consistent with all the concepts described above?

A. Not entirely. While Staff has used accepted statistical methods for their service life recommendations, Staff has not incorporated other important factors into its analysis. As a result, Staff's recommendations are in my view likely to result in current depreciation rates being inadequate to recover the full costs (original cost less net salvage) of the Company's assets over their service lives. Thus, future generations of customers likely will be required to pay more than their fair share if the Commission adopts Staff's depreciation recommendations. This occurs because Staff's recommended service lives are too long when placed in context of Company plans and when compared to the service lives currently

[4] *Public Utility Depreciation Practices*, NARUC, 1996, p. 128.
[5] *Ibid.*

used by other utilities.

Q. Please state in general terms why the Commission should reject Staff's proposed changes to the average service life and survivor curve estimates.

A. Staff's average service life and survivor curve estimates for 3 accounts are based primarily on the results of the statistical analyses of historical data[6], and do not appear to incorporate other important factors. By this, I mean that Staff has demonstrated little or no consideration for factors beyond the statistical analysis. It is standard industry practice to examine observable trends in historical data, the mortality characteristics of the assets being studied, individual utility plans, potential changes in types of assets being installed, changes in environment, management and governmental requirements, and obsolescence due to the introduction of new technologies. Because Staff does not appropriately consider these factors, Staff has recommended service lives for these three (3) accounts that reflect unrealistic expectations of the life characteristics for the assets studied. The service life estimates in the Company's depreciation study represent much more reasonable estimates of service life

[6] Historical data was available for the study for most accounts from 1962 to 2015.

expectations for the Company's assets.

Q. How will you address Staff's service life proposals?

A. First, I will discuss the recommendations in our depreciation study and demonstrate that these estimates are already within the range of experience for similar assets for other companies. Staff's recommendations, for these three accounts set forth longer service lives, and should be considered outliers in the industry.

I will then discuss the importance of informed judgment in service life estimation and explain that, because Staff does not appear to have completely included that critical aspect of life estimation in its analyses, Staff's approach has resulted in unreasonable and unrealistic proposals.

Q. Has the Company presented a reasonable study of the service lives of its assets?

A. Yes. The Company's depreciation study is consistent with the traditional methods used for life analysis and life estimation throughout the gas industry and across the country, and results in reasonable estimates of service life. Over its history, Gannett Fleming has performed depreciation studies in all 50 states, as well as in all ten Canadian provinces and all three Canadian territories. Based on that experience, we can provide typical ranges of service

lives experienced by others in the industry for each property account. In other words, our experience is based upon a much greater sample within the industry than a few select companies in New York that Staff utilized.

Q. How does the Company's depreciation study differ from Staff's approach?

A. Many factors were considered in the depreciation study in addition to the statistical analysis. Based on these factors, as well as knowledge of the property being studied, it would be inappropriate to select estimates based on limited factors, as it appears Staff has done. Using informed judgment, the Company's study has produced service lives that are reasonable estimates of the future experience for each account studied and the Company's estimates are better aligned with estimates in use in the gas industry.

By contrast, Staff has recommended unrealistic service life estimates because they have not incorporated the proper judgment required to perform a depreciation study. Instead, Staff focused on the results of rolling and shrinking band analyses, and has not properly considered other relevant factors that should be used to interpret the statistical studies properly.

Q. Please explain the proper process used for life estimation in the

Company's depreciation study.

A. The estimates made for the depreciation study are based on informed judgment that incorporates statistical analysis of the Company's historical data, as well as other factors. The statistical analysis used for the study is the retirement rate method,[7] which is the most commonly used and widely accepted statistical analysis of aged retirements.

Q. Is the statistical analysis the only basis for the service life estimates in the depreciation study?

A. No. While the statistical analysis is an important component of the "life analysis" process of depreciation studies, it is only one tool in determining the life characteristics that a utility's assets have experienced historically. The goal of the depreciation study is to estimate the service lives of the assets that are currently in service, not those that were retired in the past. The process is to develop informed estimates of what will happen in the future, not to simply determine what has occurred in the past and assume it will recur.

Q. Please explain further.

A. The full process of determining the service life estimates is referred to as "life estimation." Factors other than the statistical analysis

[7] The retirement rate method is described in more detail in the depreciation study filed as Exhibit ___ (JJS-2).

should always be considered, both because the historical statistical data is not always definitive (*i.e.*, often more than one survivor curve will represent a similar fit to an original life table, as usually only a "stub curve"[8] is available for the analysis) and because the historical data may not be reflective of future experience (*e.g.*, if the Company plans to replace more assets in the future than it has historically).

Q. Is judgment also an important part of the statistical analysis?

A. Yes, it is. Judgment is important for the actual statistical analysis, and in particular the curve fitting process. In particular, judgment is critical in the selection and consideration of data points, which can impact the results of the statistical analysis.

Q. Please provide an example of how the service life estimates were made in the Company's depreciation study.

A. Account 375, Structures and Improvements is a good example of how informed judgment must be incorporated into the service life estimates. For this account, there are specific reasons to expect

[8] A "stub curve" means that the original life table developed from the historical data is not a complete curve, *i.e.* it does not reach 0% surviving. Because the retirement rate method generally will only produce stub curves for many accounts, there is typically an aspect of forecasting or projecting future experience in the statistical analysis (even if no other factors are considered).

that the Company's future experience will not be the same as the Company has experienced historically. The type of building or assets that will be added to this account into the future is very different than the assets currently in the account. For the last few decades, the Company has not constructed large brick buildings for measuring and regulating stations, therefore, the future of such assets will not see as long a life as experienced historically for such account.

Q. What impact will these plans have on the service lives of structures and improvements of regulating stations?

A. The impact will be a higher rate of all the retirement units than has occurred historically. Therefore, when considering all components within the account, the average and maximum life will be getting shorter than the average and maximum life currently utilized. This, combined with the older buildings finally reaching the end of their lives, must be fully considered and factored into future expectations.

Q. In the example discussed above, you have explained how factors other than the statistical analysis should be incorporated into the informed judgment used to estimate service lives. Is informed judgment also important in the actual curve fitting process?

A. Yes. As indicated in the example discussed above, informed judgment is critical in the life estimation process. Informed judgment is also critical for the actual curve fitting process. The curve fitting process is not (nor should it be) simply an exercise in selecting mathematical or visual best fitting curves. Depending on the selection of data points and the judgment in extrapolating the survivor curve beyond the available or significant data, the curve fitting process can produce very different results. For this reason, informed judgment is critical for the proper interpretation and extrapolation of data. Staff's approach does not properly interpret the historical data.

Q. You have discussed the approach to curve fitting above. Do authoritative sources support your approach to curve fitting?

A. Yes. As an example, in *Depreciation Systems* by Wolf and Fitch the authors explain that when curve fitting the depreciation professional must "decide which points or sections of the curve should be given the most weight." Wolf and Fitch go on to explain:

> Points at the end of the curve are often based on fewer exposures and may be given less weight than points based on larger samples. The weight placed on those points will depend on the size of exposures. Often the middle section of the curve (that section ranging from approximately 80% to 20% surviving) is given more weight than the first and last sections. This middle section is relatively straight and is the

> portion of the curve that often best characterizes the survivor curve.

Wolf and Fitch also explain that curve matching should not be the only analysis performed:

> On the surface, the removal of judgment from the fitting process may appear to be an advantage, but blind acceptance of mechanical fitting processes will occasionally but consistently result in poor results. A better procedure is to use the least squares method to select candidates for the best fit. Comparison of the sum of squares will reveal situations where the difference between the best choices is small. The analyst should then visually examine the observed data and compare them to the theoretical curves. This can be done quickly on a computer with graphic capabilities so that the analyst need not use time to plot the observed curve by hand. The analyst can consider single points that contribute significantly to the sum of squares but that may deserve less weight than other points. Fits at various sections on the curve can be evaluated and weighted using the judgment of the experienced analyst.

Q. Have you followed the approach to curve fitting discussed by Wolf and Fitch?

A. Yes.

Q. Has the Staff Gas Panel agreed with all of your recommended life and salvage parameters in this case?

A. The Staff Gas Panel has agreed with all of my net salvage estimates and most of the life parameters. There were only three accounts that Staff did not agree with my estimates. The accounts were Account 367.1, Mains – Excluding Cathodic Protection;

Account 375, Structures and Improvements; and Account 376.4, Mains – Plastic.

Q. Have you conducted life analyses for all accounts utilizing the same methodology?

A. Yes.

Q. Can you illustrate the differences in estimates for Account 367.1, Mains – Excluding Cathodic Protection?

A. Yes. My life estimate is the 65-R2 survivor curve while Staff has proposed the 70-R2 survivor curve. The determination of each life estimate in the depreciation study consists of a combination of statistical analyses and informed judgment. As described on page I-4 of Exhibit JJS-2, informed judgment includes estimates of other gas utilities, the current estimate for this Company and discussions with management as to causes of retirement and future expectations of the asset class. The current estimate is a 60-H2.25 survivor curve.

In contrast, Staff's methodology was to utilize the statistical rolling and shrinking band analyses without considering any specific plans for these assets. The statistical analyses supports the R2-type curve. Staff has stated in testimony that they recommend changing to a R3 type curve, however, all exhibits support the use

of a R2 type curve.

Q. What can you conclude from Staff's testimony and exhibits regarding which type curve they are recommended for Account 367.1, Mains – Excluding Cathodic Protection?

A. Given the life estimates that Staff requested during discovery and the development of the theoretical reserve set forth in Exhibit (SGRP-7), Staff must be recommending the R2-type curve, not the R3 type curve.

Q. Do you agree with Staff's change in life parameter for Account 375.00, Structures and Improvements?

A. No. Staff states in its testimony that the life estimate of 75 year average service life was based only on rolling and shrinking band analyses. Staff's position completely ignores the currently approved estimate of 65-H2.50 as well as the Company's transition in the type of buildings being constructed in recent times. The structures in Account 375.00, Structures and Improvement, represent measuring and regulator structures which, in the early years, were constructed of brick or concrete block. In recent years, more of these Company structures are constructed of pre-fabricated steel, which simply do not have as long a life expectancy as brick or concrete block structures. These newer buildings are

constructed to fit the newly reconfigured measuring and regulating stations, which are more likely to be relocated. It should also be recognized that property units in this account include roofs, windows, doors and HVAC systems. Additionally, many of the newer assets into this account represents fencing and station barricades. These assets will have an overall shorter life cycle, therefore, the investment mix of the large brick structures and the smaller type structures being placed in service does not justify a ten-year increase in life. Also, Staff's recommended 75-R2.5 survivor curve reflects a maximum life cycle of 135 years. This is not reasonable for the type of assets in the account.

Q. Did Staff follow the same methodology for Account 376.4 Mains – Plastic as the other two accounts that were changed from your estimates?

A. No. For Account 376.4, Staff states they used the same methodology to increase life of plastic mains from 60 to 70 years, then Staff further adjusted the life another 10 years, pushing the expected average life of plastic mains out to a total of 80 years.

Q. Does Staff's process in determining the 80-year life for plastic mains follow the methodology recommended by authoritative texts and described previously in this testimony?

A. No. Staff has attempted to include additional information beyond the statistical analyses which is important, however, Staff's basis for determining the increase to 80 years ignores all the forces of retirement, and in my opinion, is unsupportable.

Q. Staff states on page 67 of its testimony that plastic will have a life as long or longer than cast iron or steel pipe. Do you agree?

A. There are no statistical analyses that support this statement. Plastic pipe has only been in service for 40 to 50 years, therefore, a full life cycle has not occurred. Thus, Staff's statement that plastic pipe is not subject to chemical reactions which cause corrosion is only one force of retirement. In fact, certain early vintage plastic mains have already been replaced, or are being targeted for replacement, for a variety of reasons. The Commission itself has recognized, in its April 17, 2015 Order Institution Proceeding For a Recovery Mechanism to Accelerate the Replacement of Leak Prone Pipe in Case 15-G-0151, that certain early vintages of plastic are considered leak prone. (Order at footnote 1). Further, Staff does not address that plastic pipe is more susceptible to dig-ins as identifying plastic pipe underground is very difficult. Plastic pipe is also more susceptible to such impingements which cause retirement. Additionally, there are other forces of retirement that

Staff does not consider when proposing an 80-year average life. These are replacements due to washouts and erosion due to weather events; relocations due to highway department, municipal utility and private construction projects; replacements due to material, component or joint failure, system improvements due to increased customer loads and reductions in local production gas supplies; low pressure system improvements in flood areas, known as storm hardening; and replacement of segments of plastic mains in conjunction with leak prone steel, cast iron and wrought iron replacements.

Q. Is it reasonable to increase lives drastically for major asset classes as Staff suggests given the high focus on system infrastructure improvements?

A. No. There is a focus industry-wide on infrastructure improvements which in itself should prevent recommendations for unnecessarily long recovery patterns of investment such as plastic pipe.

Q. Has Staff made adjustments to the depreciation reserve for the rate year?

A. Yes. Staff has attempted to adjust the forecasted depreciation expense based on a monthly calculation instead of the traditional

annual calculation commonly utilized with future rate years.

It is not reasonable to expect all projected activity, which includes closing retirement and construction work orders, to occur exactly when the asset goes into service and the associated cost of removal and gross salvage to be recorded simultaneously. Additionally, if the Company is to be required to base depreciation accruals on a monthly basis then one would have to update the depreciation accrual rate every month. These are unrealistic requirements when projecting forecasted levels of depreciation.

Q. Does this conclude your Rebuttal Testimony?

A. Yes, at this time.