TAB 11

Testimony of David Fox (COSS) and Attachments

STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION
DW 20-156

DIRECT TESTIMONY
OF
DAVID M. FOX, MANAGER
RAFTELIS FINANCIAL CONSULTANTS, INC.

IN THE MATTER OF THE
REVISION OF RATES
FILED BY
PENNICHUCK EAST UTILITY, INC.

PREFILED TESTIMONY OF
David M. Fox

Q: Please state your name and business address?

A: My name is David M. Fox and my business address is 20 Main St. Suite 301, Natick, MA 01760.

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

A: I am a Manager of Raftelis Financial Consultants, Inc. a nationwide consulting firm specializing in water and wastewater rate and financial planning studies.

Prior Experience

Q: Please describe your qualifications and experience.

A: I have a bachelor's degree in Economics from Coastal Carolina University in Conway, SC and a master's degree in Economics from Clemson University in Clemson, SC. After graduating in 2009, I was employed by Raftelis Financial Consultants, Inc. (Raftelis). Over the course of my career, I have worked on over 100 water and wastewater rate and financial studies within the United States. I have also had the opportunity to work on numerous financial feasibility studies in support of revenue bond issues, capital program financing support, customer rate affordability analyses, utility valuations studies, and rate benchmarking surveys. I currently lead Raftelis' New England efforts based out of our office in Natick, MA.

Q: Do you belong to any professional organizations or committees?

A: Yes, I am a member of the American Water Works Association, the New England Water Works Association, Massachusetts Water Works Association, and the Rhode Island Water Works Association. I also sit on the Financial Management Committee of the New England Water Works Association. For the American Water Works Association, I also contributed to the most recent (7th edition) of the M1 Manual on rates – *Principles of Water Rates, Fees, and Charges*.

Q: Have you previously been involved in matters before state regulatory commissions on rate related matters?

A: Yes. I have submitted or prepared expert cost of service analyses in support of water rate filings at the Massachusetts Departments of Public Utilities, and Rhode Island, New Hampshire, and Maine Public Utilities Commissions.

Summary

Q: What is your role in this proceeding?

A: Working with the staff of and advisers to the Pennichuck East Utility, Inc. (PEU), I have prepared a cost of service study and developed new rates based on *pro forma* revenue requirements as developed and presented by Mr. Ware in his pre-filed testimony and corresponding schedules. My testimony and supporting schedules include a cost of service study that allocates the functional costs to various cost components, and then distributes those costs to types of service. Finally, I utilized these data and developed new cost of service based rates and charges, along with corresponding customer impacts.

Q: What was the basis for your cost of service study?

A: In general, I followed the cost of service methodology as outlined in the guidance provided in the most recent (7^{th}) edition of the American Water Works Association's M1 Manual of Practice. This is the most widely accepted and used cost allocation method used to calculate water rates.

Q: Will you summarize your findings and conclusions regarding PEU's cost of service and proposed rates?

A: Yes.

- Based on the results of my cost of service study, there will not be an equal percentage or across-the-board change to all of PEU's existing tariffs. Metered rates, customer service charges, and fire protection charges are proposed to be adjusted by varying amounts to equitably recover the cost of service.
    - The metered rate per one hundred cubic feet (Ccf) will increase from $7.51 to $9.42, or by approximately 25%.
    - The customer service charge for a 5/8" customer, which comprise approximately 96% of all PEU customers, will increase from $20.70 per month to $24.17 per month. All other meter sizes will increase or decrease at various percentage changes to coincide with cost of service. Please refer to my accompanying schedules for detail with regard to the rates for other meter sizes.
    - Public fire protection charges, assessed per hydrant and inch-foot of mains, are proposed to increase by varying percentages. Hydrant charges are proposed to increase from $16.07 per month to $34.39 per month. Inch-foot charges are proposed to increase from $0.01231 per inch-foot to $0.01279. These increases reflect the significant investment and capacity PEU has to provide public fire protection services.
    - Private fire protection charges will all change by varying percentages based on the size of the connection. Please refer to my accompanying schedules for more detail.

Content of Schedules

Q: Please describe the schedules included with your pre-filed direct testimony.

A: I have included 7 main schedules (DF 1 through 7). The schedules included in this filing are:

- Schedule DF - 1 - This schedule presents the *pro forma* revenue requirements, depreciation, and plant-in-service records functionalized between general water service, fire protection, and customer service. Please refer to

Mr. Ware's testimony and schedules for more detail on revenue requirements and adjustments.

- Schedule DF - 2 – This schedule presents the units of service including the number of meters by size and billing frequency, the number of private and public fire services by size of connection, hydrants, and inch-feet of mains, and metered water consumption. This schedule also presents meter and demand equivalents, which I will cover later in my testimony.
- Schedule DF - 3 – This schedule summarizes the allocation of total fire service to public and private service, and proposed fire protection calculations and charges.
- Schedule DF - 4 – This schedule summarizes the allocation of customer related revenue requirements to metered and billing related components, and proposed customer service calculations and charges.
- Schedule DF - 5 – This schedule presents the proposed metered rate and its derivation.
- Schedule DF - 6 – This schedule presents a summary of the current rates and the proposed rates derived from the cost of service study. This schedule also presents a proof of revenue, showing the annual revenues under the proposed rates and charges, and how they tie to the ultimate revenue requirement.
- Schedule DF - 7 – This schedule presents the impact of the proposed rates and charges on various types of customers. A typical PEU customer uses approximately 5 Ccf per month.

Units of Service

Q: Did you analyze water sales, numbers of meters and fire service units of service?

A: Yes. Schedule DF - 2 presents the number of meters by size, the number of public fire hydrants and private fire services by size as well as inch-feet of mains, and metered water use.

Q: You present several meter-related equivalents on Schedule DF - 2. Please explain these.

A: For the purposes of allocating fixed service charges to meter sizes, I used cost and flow capacity equivalents. Cost equivalents are based on the investment and replacement costs of meters by size, while flow equivalents are based on the flow capacity of each meter size. That is, within approximation, a 2" meter costs 5.5 times more than a 5/8" meter, and has 8 times the flow capacity. Cost equivalents were utilized to scale meter related costs to meter size, while flow equivalents were utilized to scale readiness-to-serve costs. Readiness-to-serve reflects the investment PEU has made in its infrastructure to be able to provide service to its customers 24 hours a day, 365 days a year, whether customers are using those services or not. This amount was approximated by recovering one third of PEU's fixed debt service obligations.

To determine the appropriate fire protection charges I determined the potential water demand from hydrants and private fire services. The demand through a closed pipe under pressure is proportional to the diameter of the pipe to the 2.63 power (Hazen Williams formula for flow through a pipe under pressure). The flow is not proportional to the square of the diameter because of head (flow) losses against the pipe walls. Smaller pipes have more pipe wall per square foot of area. These equivalents were used to determine the relative cost-based charges for each pipe size.

<u>Rate and Charge Calculations</u>

Q: **Please describe what you did next.**

A: Once *pro forma* revenue requirements and the units of service had been established, I began to functionalize and allocate the costs to types of service (water, fire protection, customer). Please refer to Schedule DF - 1 for presentation of the functionalization of revenue requirements. Ultimately said functionalized revenue requirements were then utilized to calculate cost of service based rates. The first such assignment led to the derivation of fire protection charges.

Q: Please explain how you calculated the proposed fire protection charges.

A: Because the costs associated with public fire hydrants should not be charged to private fire services, I first removed the costs directly related to hydrants from the total fire service allocation. Based on the relative potential demands presented on Schedule DF 2, I split the remaining fire service demand costs (net of hydrant expenses) to public and private fire service. In the case of the public fire service charges I added the allocated public fire service costs to the direct hydrant expenses and divided by the total number of public fire hydrants in PEU's system or arrive at an annual per hydrant charge. To derive the private fire service charges, I simply determined the number of private fire service equivalents using the fire demand factors described earlier in my testimony. This cost per equivalent was then applied to the equivalency factors for each private fire service size to derive the fire service charge for each size private fire service.

Q: What was the next cost of service element that you allocated?

A: I then allocated revenue requirements to customer related charges. In the case of these charges, the revenue requirements were split into two components: (a) those costs related to meters and service pipes (vary by the size of the meter and service) and (b) those costs related to billing, meter reading, and collections (vary by the number of billings). In addition to these explicit allocations, I also added one-third of PEU's debt service obligations to the service charge revenue requirements to reflect a reasonable cost amount to be recovered for maintaining adequate readiness-to-serve.

Q: Please explain the derivation of your proposed service charges.

A: For the metering and readiness-to-serve components of the service charge, I calculated a cost per equivalent meter, and then scaled this cost up by meter size based on the aforementioned meter equivalents. I then calculated a per-bill charge for the billing component (same for all meter sizes) and added that to each meter component.

Q: How did you then proceed with your cost of service and rate calculation?

A: For those revenue requirements allocated to general water, I simply divided into that amount the rate year billable units to arrive at a per-Ccf rate.

Q: Have you provided a summary of the proposed rates and its impact on customers?

A: Yes. Schedule DF - 6 presents PEU's current rates compared to the proposed rates along with the annual percentage change. Schedule DF -7 presents the impact of the proposed rates to various customer types. Please note again that a typical PEU customer uses approximately 5 Ccf per month.

Q: Have you provided a revenue proof summary?

A: Yes. Pages 3 and 4 of Schedule DF - 6 presents PEU's projected revenue, by rate component.

Conclusion

Q: Does this conclude your testimony?

A: Yes, it does.