

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

**BEFORE THE
RHODE ISLAND PUBLIC UTILITIES COMMISSION**

**IN RE:
CITY OF NEWPORT, UTILITIES DEPARTMENT,
WATER DIVISION APPLICATION TO CHANGE
RATE SCHEDULES**

Docket No. 4128

Surrebuttal Testimony and Exhibits of

Ernest Harwig

On behalf of

The United States Department of the Navy

May 3, 2010

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Surrebuttal Testimony of Ernest Harwig

1 **Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A My name is Ernest Harwig. My business address is 57 Cedar Summit Road, Asheville,
3 North Carolina, 28803.

4 **Q WHAT IS YOUR OCCUPATION?**

5 A I have been a consultant in the field of public utility regulation for over 30 years, with an
6 emphasis on water and wastewater utilities.

7 **Q ARE YOU THE SAME ERNEST HARWIG WHO FILED DIRECT TESTIMONY IN THIS**
8 **PROCEEDING?**

9 A Yes. I filed direct testimony in this proceeding on January 29, 2010. My educational
10 background and experience are summarized in Appendix A attached to that testimony.

11 **Q ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

12 A I am under contract to Brubaker & Associates, Inc. and have been asked to testify on
13 behalf of the United States Department of the Navy ("Navy"). Naval Station Newport in

Newport, Rhode Island purchases large volumes of water from the Water Division of the City of Newport ("NWD" or "Newport"). Thus, the Navy has a direct economic interest in how the cost of providing water service to it is determined.

Q WHAT IS THE SUBJECT OF YOUR SURREBUTTAL TESTIMONY?

A My surrebuttal testimony may be summarized as follows:

1. Newport's rates for water service, with the possible exception of monthly service charges based on meter size, should not be changed for any customer class in this proceeding. Newport has presented no reliable basis for determining the cost to serve the various customer classes.
2. The parties to this case had anticipated that the customer class demand study conducted during the May – September period of 2009 would provide reliable data for calculating class maximum day and maximum hour demand ratios to be used as the basis for allocating costs. Due to the unusually wet summer of 2009 and sampling errors in the residential and commercial sectors, the study produced dubious class peaking ratios, which even Newport did not utilize as the basis for the rates it recommended in either its direct or rebuttal testimonies. The Commission should reject the demand study results as a basis for setting water rates.
3. In a second attempt to determine class peaking ratios, Newport averaged production volumes and synthesized class billing data from the fiscal years 2007 through 2009 to manufacture system wide and class maximum day and maximum hour ratios. Because of the averaging process, class peaking ratios are understated, with the result that peaking-related costs are not assigned to the classes that cause them. The Commission should also reject this second attempt by Newport to allocate costs and design water rates in this proceeding.
4. The Commission should immediately order Newport to conduct a follow-up demand study for the May – September 2010 period, with the impending study benefiting from a knowledge of the mistakes made in designing and conducting the prior 2009 demand study. Newport should keep all parties apprised of its choices of customers to be included in the new demand study and provide periodic updates to avoid the controversy surrounding the 2009 study.
5. Newport should file a cost of service study based on the 2010 demand study as a basis for rates in its next base rate filing.

2009 Customer Class Demand Study

Q PLEASE DISCUSS THE BACKGROUND AND THE PERFORMANCE OF NEWPORT'S 2009 CUSTOMER CLASS DEMAND STUDY.

A Very briefly, Newport's rates have not been set on the basis of a fully-allocated customer class cost of service study for quite some time, and there was concern that the rates did not accurately reflect differences in the costs to serve various customer classes. To remedy this situation, Newport was ordered to perform an empirical customer class demand study that reasonably depicted the relative peak day and peak hour demands placed on the water system by Residential, Commercial and Wholesale Customers. The other parties to this case, the Division, the Navy and Portsmouth Water and Fire District (PWFD), expected that the system and customer class demand ratios developed from daily meter reads would be factored into a cost of service study, with that study becoming the basis for adjusting rates to reflect more closely the cost of serving each class.

However, several factors compromised the validity, and therefore the usefulness, of the demand study results. First, the summer of 2009 was atypically wet in Newport, which could reasonably be expected to reduce the need for residential lawn watering. Second, some residential and commercial customers were dropped from the study. Others were added, but in a fashion that does not suggest that they were chosen randomly. Third, some of the customers who were finally included in the study exhibited unusual usage patterns, but were still included in the final calculations of peak day and peak hour ratios for the residential and commercial classes. (The deficiencies listed above were discussed in more detail in the Direct Testimony submitted by Mr. Woodcock on behalf of PWFD on Pages 12 through 16.)

**Q WHAT RESULTS DID NEWPORT'S DEMAND STUDY PRODUCE IN TERMS OF
CUSTOMER CLASS PEAK DAY AND PEAK HOUR RATIOS?**

A The actual ratios are shown at the top of Page 13 in the Direct Testimony of Mr. Harold Smith, appearing on behalf of Newport. The Residential class maximum day and maximum hour ratios are 1.67 and 2.00, respectively. These ratios are lower than those of any of Newport's other customer classes. Low ratios in and of themselves suggest that these classes are less responsible than others for causing the system peak volumes, which require greater operating and capital costs.

Q WHAT IS YOUR RESPONSE TO THIS RESULT?

A At best, it strains credulity. As I stated in my direct testimony, this is the only instance of a cost of service study I have ever encountered in which the Residential class peaking factors are less than those of other customer classes. As a result, I have to believe that errors were introduced in either the design or the implementation of the demand study. I conclude that the class peak ratios produced by the demand study are not useful for cost allocation purposes.

Q ARE YOU ALONE IN YOUR EVALUATION OF THE DEMAND STUDY RESULTS?

A No. Mr. Woodcock's objections to Newport's class peaking factors can be found on Page 15 of his Direct Testimony. Additionally, in Response to Navy Data Request 1-3 to the Division, regarding the use of class peaking factors in his cost of service study, Mr. Jerome Mierzwa stated, "... [Newport's] study produced results which were *unexpected* and to be conservative, Mr. Mierzwa accepted Mr. Smith's billing data calculation which produced results which were *more consistent with expectations*." (Emphasis added. See Exhibit EH-1 for the entire Data Request and Response.)

1 Most tellingly, Newport itself has not seen fit to use the class peaking factors
2 from its demand study to calculate its recommended rates in either its direct or rebuttal
3 testimonies. This suggests that even Newport has reservations about the validity of its
4 own demand study. Thus, I recommend that the Commission reject the results of the
5 2009 demand study submitted by Newport in this proceeding as unrepresentative and
6 unrealistic.

7 **Billing Demand Cost of Service Study**

8 **Q WHAT DATA DOES NEWPORT USE TO CALCULATE PEAK DAY AND HOUR**
9 **DEMANDS FOR THE ENTIRE UTILITY AND FOR INDIVIDUAL CUSTOMER**
10 **CLASSES?**

11 A In its Direct Testimony, Newport used customer class billing data for the FY2007 –
12 FY2009 period to develop both system demand ratios and class demand ratios. Later,
13 in its Rebuttal Testimony, Newport incorporated almost all of the modifications
14 recommended by Mr. Mierzwa and several of those recommended by Mr. Woodcock in
15 their Rebuttal Testimonies regarding fire protection cost, attribution of unaccounted for
16 water volumes and transmission/distribution cost allocation among others. Still, Newport
17 relied upon its manipulations of the class billing data for the majority of its cost
18 allocations.

19 **Q DO YOU HAVE CONCERNS WITH NEWPORT'S USE OF BILLING DATA FOR**
20 **ALLOCATION PURPOSES?**

21 A Yes, I do. The cost of service study filed with Newport's Rebuttal Testimony is an
22 improvement over the one in its Direct Testimony. Nonetheless, its reliance on
23 averaged billing data makes it unsuitable as a basis for cost allocation and rate design.

1 **Q PLEASE EXPLAIN.**

2 A In short, Newport's reliance on three-year average production volumes and averaged
3 billing data understates the peak day and peak hour demands for the entire water
4 system and for the individual customer classes. As a result, Newport's study assigns an
5 excessive amount of costs to the base, or average day use cost category. Put another
6 way, the responsibility for peak-related costs imposed by each class on Newport is
7 understated.

8 Turning first to Newport's calculation of system peaking ratios, the second Table
9 on RFC Rebuttal Schedule B-10 shows a Base-Maximum Day classification factor of
10 61.6% - 38.4%, and a Base-Maximum Day-Maximum Hour classification factor of
11 48.1%-30.0%-21.9%, respectively. However, these factors are derived from averaged
12 annual production, averaged peak day production, and averaged peak hour production
13 from the FY2007 – FY2009 period, shown on Newport Schedule B-7. This is clearly
14 contrary to the approach recommended on Page 297 in *Principles of Water Rates, Fees,*
15 *and Charges*, Fifth Edition, published by the American Water Works Association
16 (AWWA) in 2000, which advocates the use of annual peak volumes for allocation
17 purposes. Mr. Smith acknowledged as much in his response to PWFD Data Request 1-
18 14 (See Exhibit EH-2).

19 Had Newport followed the AWWA recommendation, the classification factors
20 would have been calculated as follows:

Table 1					
Base-Max Day			Base-Max Day-Max Hour		
	<u>Volume (MGD)</u>	<u>Percent</u>		<u>Volume (MGD)</u>	<u>Percent</u>
Base	6,775	56%	Base	6,775	44.6%
Max Day	<u>5,325</u>	<u>44%</u>	Max Day	5,325	35.0%
Total	12,100	100%	Max Hour	<u>3,100</u>	<u>20.4%</u>
			Total	15,200	100.0%

This shows that Newport's two major classification factors overstate base costs by 5.6% (61.6% - 56%) and 3.5% (48.1% - 44.6%), respectively. Conversely, peak-related costs are understated.

Q WHY DOES NEWPORT'S USE OF AVERAGED CLASS BILLING DATA CAUSE AN UNDERESTIMATE OF THE PEAK LOADS IMPOSED BY THE RESIDENTIAL AND COMMERCIAL CUSTOMER CLASSES?

A Because Newport only reads most residential and commercial meters on a quarterly basis, the readings encompass three months' worth of water usage. Thus, it is simply impossible to determine in which month peak usage occurred or how much water a class used in any one month, let alone the peak month. The problems associated with this lack of monthly data are discussed in detail in Mr. Woodcock's Direct Testimony on Pages 17 through 20, and it is not necessary to repeat them here.

Moreover, Newport's averaging of the so-called peak month volumes, even if the peaks did occur in those months (and they most likely did not), necessarily understates the peak month consumption of those classes. These monthly averages were, in turn, used to estimate the class maximum day and maximum hour peaking factors that are

1 applied to Newport's operating and capital costs. Thus, the underestimates of peak
2 demands lead to an understatement of class allocation factors.

3 **Q ARE THERE OTHER INDICATIONS IN THE BILLING DEMAND COST OF SERVICE**
4 **STUDY THAT SUGGEST CLASS PEAK DEMANDS WERE NOT SUFFICIENTLY**
5 **DISTINGUISHED FROM ONE ANOTHER?**

6 **A** Yes. Newport's RFC Schedule B-8 Rebuttal shows the following Max Day and Max
7 Hour ratios calculated by Mr. Smith.

Table 2		
<u>Class</u>	<u>Max Day Ratio</u>	<u>Max Hour Ratio</u>
Residential	1.97	2.37
Commercial	2.16	2.87
Navy	1.90	2.40
PWFD	2.08	2.61

8 An inspection of these ratios shows that they lie within a very narrow range: only
9 a value of 0.26 separates the highest from the lowest Max Day ratios (2.16 – 1.90), and
10 a value of 0.50 separates the highest from the lowest Max Hour ratio (2.87 – 2.37). The
11 differences among the classes are virtually nil. I believe this is the inevitable result of
12 using averaged daily and peak volumes to calculate class allocation factors. Further, it
13 does not accord with my knowledge of water cost of service studies I have dealt with in
14 the past.

Q YOU HAVE ARGUED THAT THE SYSTEM PEAK DEMAND RATIOS ARE UNDERSTATED AND THAT RESIDENTIAL AND COMMERCIAL CLASS PEAKING FACTORS ARE UNDERSTATED AS WELL. WHAT IS THE RESULT OF BOTH FACTORS BEING UNDERSTATED?

A The result is that the error of understatement is compounded. A class whose individual peaking factor is understated benefits twice. The end result is an understatement of its cost of service.

Q IN LIGHT OF THE ERRORS THAT HAVE BEEN INTRODUCED INTO THE COST OF SERVICE STUDY, WHAT IS YOUR RECOMMENDATION TO THE COMMISSION?

A I recommend that the Commission not approve either the Rebuttal cost of service study or the rates that result from it. Likewise, to the extent that Mr. Mierzwa's study relies on Newport's class demand factors, it is also defective and does not provide a reliable basis for setting rates in this proceeding.

Q IN YOUR DIRECT TESTIMONY, YOU RECOMMENDED THAT THE COMMISSION ACCEPT NEWPORT'S COST OF SERVICE STUDY. WHY DID YOU MAKE THAT RECOMMENDATION EARLIER?

A As I stated in my Direct Testimony, I was troubled by the class peaking factors produced by the demand study. The billing data study did ameliorate those results in part, in that they more closely approached the class demand values that one would normally expect. That is apparently why Mr. Mierzwa used the billing data class demand factors as well. The rates resulting from Newport's original study did not deviate excessively from Newport's existing rates, and they did not produce an inordinate cost increase to the

1 Navy or Portsmouth. Thus, I recommended that the Commission accept the cost study,
2 but only so there would be a basis for the rates recommended by Newport in the record.

3 **Q IS THE NAVY SIMPLY TRYING TO OBTAIN THE LOWEST POSSIBLE RATE IN THIS**
4 **PROCEEDING?**

5 A No, it is not. The Navy has argued during the course of several of Newport's water rate
6 cases that rates for all classes should be based on the cost to serve each class.
7 However, neither the class demand study nor the billing data study in this proceeding
8 provides a reliable basis for allocating costs.

9 **Q ARE THERE ELEMENTS IN NEWPORT'S REBUTTAL COST OF SERVICE STUDY**
10 **THAT SHOULD BE RETAINED IN ANY FUTURE STUDY?**

11 A Yes, there are. Newport's rebuttal study attributes a share of unaccounted for water
12 volumes to the Navy. So long as the calculation of this volume is based on reasonable
13 methods, the Navy would not object. Also, the rebuttal study reduces the share of
14 transmission and distribution costs attributable to the Navy. Since the Navy does not
15 use Newport's grid of smaller distribution mains to take water service, this modification is
16 also acceptable.

17 **Q WHAT IS YOUR RECOMMENDATION TO THE COMMISSION GOING FORWARD?**

18 A The Commission should immediately order Newport to conduct a follow-up demand
19 study for the May – September 2010 period, with the impending study benefiting from a
20 knowledge of the mistakes made in designing and conducting the prior 2009 demand
21 study. Thus, the new demand study would

- 22 1. Incorporate more large commercial customers to capture and reflect the main causes
23 of peak demands within this class;

- 1 2. Exclude residential and commercial customers who exhibit anomalous or atypical
2 meter readings; and
- 3 3. Avoid excessive homogeneity or overweighting of customer types within a class by
4 concentrating on a small geographic area.

5 Newport should also keep all parties apprised of its choices of customers to be
6 included in the new demand study and provide periodic updates to avoid the controversy
7 surrounding the 2009 study.

8 Finally, Newport should file a cost of service study based on the 2010 demand
9 study as a basis for rates in its next base rate filing. In the interim, a revenue neutral
10 change in monthly and quarterly service charges is acceptable to the Navy. Otherwise,
11 rates should remain unchanged until a sound basis for doing so has been offered.

12 **Q DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?**

13 **A Yes, it does.**

CITY OF NEWPORT

**Utilities Department – Water Division
Docket No. 4128**

**Data Requests to the Division of Public Utilities & Carriers
From the United States Department of the Navy**

- 1-3. Mr. Mierzwa makes no reference to Newport's 2009 Customer Class Demand Study in his direct testimony, and he utilizes the identical class peaking factors as calculated by Mr. Harold Smith on behalf of the City of Newport in his JDM Schedule B-9.
- a. Is it correct to infer that Mr. Mierzwa agrees with Mr. Smith's use of billing data from FY2007 to FY2009 to calculate class Maximum Day and Maximum Hour peaking ratios?
 - b. Is it also correct to infer that Mr. Mierzwa disagrees with the results of Newport's 2009 Customer Class Demand Study as it pertains to the relative customer class maximum day and maximum hour peaking factors obtained by Newport from that study?

Response

3.a. It is not correct to infer that Mr. Mierzwa agrees with Mr. Smith's use of billing data from FY 2007 through FY 2009 to calculate Maximum Day and Maximum Hour peaking ratios. Mr. Mierzwa believes that the results of Newport's 2009 Customer Class Demand Study ("Study"), which is based on actual customer usage, should be given weight. However, the Study produced results which were unexpected and to be conservative, Mr. Mierzwa accepted Mr. Smith's billing data calculation which produced results which were more consistent with expectations.

- b. See the response to part (a).

STATE OF RHODE ISLAND PUBLIC UTILITIES COMMISSION

DOCKET NO. 4128

City Of Newport - Utilities Division - Water Department

Response to

Portsmouth Water and Fire District's Data Requests

Set 1

PWFD 1-14: Regarding RFC B-7, does Mr. Smith agree that page 297 of the referenced AWWA Manual suggests that:

- a) the “highest ratio of system maximum-day demand to system average-day demand over the most recent five year period” be used? Did Mr. Smith use a three year average rather than the highest ratio?
- b) “the system maximum-month production or treatment plant output for that year” be used (emphasis added)? Did Mr. Smith use an average rather than “that year”?
- c) “the system maximum-hour demand for that year” be used (emphasis added)? Did Mr. Smith use an average rather than “that year”?
- d) “(t)he customer billing records necessary to complete the analysis are the monthly billed consumption records...” (emphasis added)? Did Mr. Smith use quarterly or tri-annual billed consumption records rather than monthly billed consumption records for his analysis? When did Newport begin quarterly billing (rather than tri-annual)? Does Newport estimate one reading every year, or are all the quarterly readings actual?
- e) if monthly data is not used the results will “likely be less accurate”?

Responses:

- a. I agree that the M-1 Manual suggests that the “highest ratio of system maximum-day demand to system average-day demand over the most recent five year period” be used. The cost of service study uses a three year average as shown on RFC Schedule B-7.
- b. I agree that the M-1 Manual suggests that “the system maximum-month production or treatment plant output for that year” be used. As indicated on RFC Schedule B-7 and in my response to PWFD-14a., an average system maximum-month was used.
- c. I agree that the M-1 Manual suggests that “the system maximum-hour demand for that year” be used. I used an average.
- d. I agree that the M-1 Manual suggests that “(t)he customer billing records necessary to complete the analysis are the monthly billed consumption records...”. Since Newport Water does not bill the majority of its customer on a monthly basis, the analysis uses data that is a combination of monthly and quarterly data. Additionally, since Newport Water did not start billing quarterly until October of 2007, the data for FY 2007 includes data from

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Set 1

accounts that were billed three times a year. For accounts that are not equipped with radio read devices, one of the quarterly reads each year is estimated. For accounts with radio read devices, all reads are actual.

- e. I agree that the M-1 Manual suggests that if monthly data is not used the results will "likely be less accurate". However, if the cost of service study performed for Newport Water were to rely on monthly data alone, there would be no data for the vast majority of its customers.

Prepared by: Harold J. Smith