

UNITIL ENERGY SYSTEMS, INC.

DIRECT TESTIMONY OF PAUL M. NORMAND

LEAD-LAG STUDY

EXHIBIT PMN-1

**State of New Hampshire
Public Utilities Commission**

Docket No. DE 16-384

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LIST OF ATTACHMENTS

- PMN-LL-1: Pro Forma Lead-Lag Summary
- PMN-LL-2: Qualifications of Paul M. Normand

WORKPAPERS

Lead-Lag Study Workpapers

Workpapers Supporting Lead-Lag Attachment

1 **I. INTRODUCTION**

2 **Q. Would you please state your name, address and business affiliation?**

3 A. My name is Paul M. Normand. I am a Principal with the firm of Management Applications
4 Consulting, Inc., 1103 Rocky Drive, Suite 201, Reading, PA 19609.

5 **Q. Please describe MAC.**

6 A. MAC is a management consulting firm that provides rate and regulatory assistance
7 including depreciation services for electric, gas and water utilities.

8 **Q. Please summarize your education and business experience.**

9 A. This information is contained in Attachment PMN-LL-2.

10 **II. PURPOSE OF TESTIMONY**

11 **Q. Please discuss the purpose of your testimony.**

12 A. Our consulting firm was retained by Unitil Service Corp. to conduct a lead-lag study for
13 Unitil Energy Systems, Inc. (“Unitil Energy” or “the Company”).

14 The purpose of my direct testimony is to present and sponsor the cash working capital
15 (“CWC”) requirements of Unitil Energy for its delivery services. Unitil Energy has
16 identified its revenue requirements on a pro forma basis, and we have computed the
17 CWC for that adjusted test year.

18 On a pro forma basis, the total CWC requirement for Unitil Energy Systems, Inc. is
19 \$2,659,152. This CWC requirement represents the funds that are needed due to the lag
20 between the times that payments are made by the Company and when the recovery of

1 those funds is obtained from customers. This CWC requirement is included in the
2 Company's overall revenue requirements calculation by means of the cash working
3 capital allowance included in rate base.

4 **Q. How is your testimony organized?**

5 My testimony consists of four sections. Section I is introductory information. Section II
6 describes the purpose and organization of my testimony. Section III presents results of
7 the lead-lag study we prepared on behalf of Unitil Energy to determine the pro forma
8 CWC.

9 **III. CASH WORKING CAPITAL**

10 **Definition of CWC**

11 **Q. Please define cash working capital.**

12 A. CWC is the amount of investor-supplied capital required to fund the day-to-day
13 operations of a company after accounting for the timing differences between booked and
14 actual revenues and expenses. CWC represents dollar amounts funded by investors to
15 provide service prior to receipt of payment for those services by customers. As such,
16 CWC is an appropriate addition to a company's rate base.

17 **Q. Did you perform analyses to estimate the CWC of Unitil Energy for the adjusted
18 test year?**

19 A. Yes. Attachment PMN-LL-1 summarizes the results of the lead-lag study conducted for
20 Unitil Energy using the pro forma revenue requirements for the test year ending

1 December 31, 2015. As shown in these attachments, the rate base addition for CWC is
2 \$2,659,152.

3 **Q. What is a lead-lag study?**

4 A. A lead-lag study is an analysis designed to determine the funding required to operate a
5 company on a day-to-day basis. A lead-lag study compares (1) the timing difference
6 between the receipt of service by customers and their subsequent payment for these same
7 services and (2) the timing difference between the incurrence of costs by Unitil Energy
8 and its subsequent payment of these costs. Therefore, a lead-lag study must compute
9 both a revenue lag (or lead) and an expense (lead) or lag. Attachment PMN-LL-1, page
10 1 of 3, summarizes the lead-lag study results for Unitil Energy. The CWC was developed
11 using systematic reviews of cash flows for Unitil Energy's revenues and operating
12 expenses. The lead-lag study we performed measured the base revenue requirement
13 CWC needed for Unitil Energy's day-to-day electric operations for the 12-month pro
14 forma period ending December 31, 2015.

15 **Q. Please define the terms "lag days" and "lead days" as used in your testimony.**

16 A. Revenue lag is the number of days between delivery of service to Unitil Energy's
17 customers and the subsequent receipt by the Company of payment for the service
18 (revenue lag days). Expense lag is the number of days between the receipt of goods or
19 services provided to Unitil Energy by vendors and the payment by the Company for those
20 goods and services (expense lag days).

1 Because Unitil Energy's electric customers receive service prior to paying for it, the
2 Company experiences a revenue lag in its daily operations. This revenue lag is computed
3 based upon analyses of the time lag between the date when customers receive service and
4 the date when the customers pay for such service. The longer the revenue lag, the greater
5 the length of time that investor capital is required to fund the Company's day-to-day
6 operations. The revenue lag for Unitil Energy is 57.74 days as developed in Attachment
7 PMN-LL-1, page 2 of 3, line 27.

8 Generally, expenses are paid by Unitil Energy after vendors have provided their goods or
9 services, which results in an expense lag. On occasion, the Company pays for services
10 before they are provided as an example. In these instances, the expenses lead their
11 service period. The expense lag is calculated as the number of days between the date
12 when Unitil Energy receives goods or services from a vendor and the date when the
13 Company pays for such goods or services. If the expenses are paid before the services
14 are provided, then the expense lag is expressed as a negative amount. Consequently, any
15 increase in the number of expense lag days results in a reduction of the amount of
16 working capital required for ongoing Unitil Energy operations.

17 The arithmetic difference between the computed revenue lag and the computed expense
18 lag is the number of days that stockholders must provide funding for the utility's daily
19 operations.

20 As shown on Attachment PMN-LL-1, page 1 of 3, line 29, column 4, Unitil Energy's net
21 lag days are 27.25 days.

1 **Lead-Lag Study General Approach**

2 **Q. Please describe the approach you used in preparing your lead-lag study.**

3 A. I began the lead-lag study with the selection of the per-books revenues and expenses for
4 the 12-month period ended December 31, 2015 for Unitil Energy to form the basis for my
5 analysis. I then determined the lag days in the recovery of revenue by type of revenue
6 (i.e., sales and other revenues). For operation and maintenance (“O&M”) expenses, I
7 developed lag days for each of several types of expenses (i.e., labor, employee benefits,
8 prepaid Liability Insurance, Regulatory Commission expenses, automobile leases,
9 Service Company charges, and other O&M expenses). In addition, I developed lag days
10 for property taxes, other taxes, income taxes, and interest expense. Once the lag days for
11 the test year are established on a per-books basis, they are applied to the test year pro
12 forma revenue requirements. The lead or lag days for each of the items described above
13 are then multiplied by the test year pro forma amounts to determine the dollar-days of
14 CWC. The net dollar-days of revenue less expenses and taxes may then be divided by
15 365 days to obtain the average daily CWC.

16 **Methods of Computation**

17 **Q. Please describe your calculation of revenue lags.**

18 A. The calculation of the revenue lags is summarized on page 2 of Attachment PMN-LL-1.
19 As previously described, “revenue lag” is the length of time that occurs between the
20 Company’s provision of service to its customers and the subsequent receipt of payment
21 for those services. The existence of a revenue lag makes it necessary for investors to
22 provide the funding for the Company to pay its operating costs during the lag period.

1 The measurement of revenue lag days typically consists of four components: (1) service
2 lag, (2) billing lag, (3) collection lag and (4) revenue float. Since the time periods for
3 these four components are mutually exclusive, revenue lag is computed by adding
4 together the total number of days associated with each of the four revenue lag
5 components. This total number of lag days represents the amount of time between the
6 recorded delivery of service to customers and the receipt of the related revenues from
7 customers.

8 **Q. Please describe how you calculate service lag.**

9 A. The service lag is the average time span between the mid-point of the customer's
10 consumption interval, also known as the usage period, and the time that such usage is
11 recorded by the Company for billing purposes. This service period determines the
12 average length of time over which the billed services are provided and establishes a
13 common point in time from which to measure (1) the time of reimbursement for the
14 billed services, and (2) the time at which the accrued costs for the service period are
15 actually paid. For virtually all utilities, the service lag is one-half of an average month or
16 15.21 days ($365/12/2$).

17 **Q. Please describe your calculation of billing lag.**

18 A. The billing lag is the time required to process and send out customer bills. The billing lag
19 begins at the end of the service period when customer consumption is metered, and it
20 ends when the bills are rendered and billings are posted to accounts receivable. The
21 billing lag may be influenced by factors such as whether automated or manual meter
22 reading systems are employed, the generation of invoices from this metering data and

1 other processes affecting the time to post billings to accounts receivable. Unitil Energy
2 utilizes an automated meter reading system. It posts its meter reading daily for billing the
3 next day, and it is recorded into accounts receivable on the same day. The Unitil Energy
4 billing lag was approximately 1.07 days after considering the delay for weekends and
5 holidays.

6 **Q. Please describe your calculation of collection lag.**

7 A. The collection lag identifies the time delay between the posting of customer bills to
8 accounts receivable and the receipt of these billed revenues. Collection lag begins with
9 the posting of bills and ends with the receipt of payment. Collection lag may be
10 influenced by payment arrangements, contract terms, postal delivery delays, customer
11 inquiries, delinquent accounts, service termination practices, and other factors. I have
12 employed the accounts receivable turnover ratio method to determine the collection lags.
13 Using this approach, the average monthly accounts receivable balances were divided by
14 the average daily revenues for the 12 months ended December 31, 2015. Using the
15 accounts receivable turnover method, a collection lag of 42.16 days was computed.

16 **Q. Please describe the final component of revenue lag, revenue float.**

17 A. Revenue float is the time difference between when funds are received from customers
18 until customer payments clear the banks and are available to the Company. To clarify,
19 there are two periods of float. The first is associated with the Company's payment of
20 services from vendors. Expense float, or lag, is discussed later in my direct testimony.
21 The second period of float is the delay in the Company's receipt of cash from the
22 deposited customer payments. In this latter instance, Unitil Energy's cash requirements

1 are reduced by the delay in check processing. Some lead-lag studies assume that revenue
2 float and check float are equal and offsetting and, therefore, can be removed. A closer
3 examination reveals that the issue is much more complex. The majority of Unitil
4 Energy's larger payments are made by wire transfer with a much shorter lag than a
5 conventional mailed check. On the revenue side, only a small portion of customer
6 payments are made by cash, credit card or bank transfer. Again, these payments have
7 smaller lag times to clear than conventional checks. Since the dollar volume of utility
8 payments far exceeds their receipts made by cash, credit card and bank transfer, the
9 inclusion of check float in the lead-lag study would slightly increase CWC requirements.
10 I have chosen to avoid this level of complexity with the knowledge that our simplifying
11 assumption will be conservative and slightly understate CWC and will not disadvantage
12 customers. Therefore, I have chosen not to quantify float for revenues or expenses in this
13 study.

14 **Q. How is the lag for labor expense determined?**

15 A. The Company's payroll stems from weekly or monthly payroll disbursements. Using
16 sample data, we measured the lag between the mid-point of the pay period and the pay
17 date. However, not all labor costs earned by employees in the pay period are paid out as
18 salary, the difference being payroll withholdings. In order to make an accurate
19 calculation of total labor costs, we identified all labor-related costs and identified when
20 the Company actually expended the cash. These labor-related costs include all salary
21 including incentive compensation, payroll taxes including withholding taxes, and a wide
22 range of benefits. Regular weekly payroll costs are the largest component of labor costs
23 and have the shortest payment lag. However, other components of labor costs have

1 relatively longer delays. For example, incentive compensation pay was earned from
2 January 2015 to December 2015 and was paid in February 2016, resulting in a much
3 longer expense lag. In addition to direct labor expense, we examined other labor-related
4 costs to the Company, including Payroll Taxes, and Pensions and Benefits as discussed
5 below.

6 **Q. Please describe how the lag is calculated for Pensions and Benefits.**

7 A. The method for calculating expense lags for Pensions and Benefits follows the same
8 approach used for all other lag calculations. For each expense, the service period and its
9 mid-point were determined. Then the payment date was established. The lag was then
10 computed as the difference between the payment date and the mid-point of the service
11 period. Next, a weighted average of each expense was computed to determine the overall
12 average for this category.

13 **Q. Were other categories of O&M expense analyzed separately and included in the**
14 **expense lag?**

15 A. Yes, Liability Insurance, Account 925, Regulatory Commission expenses, Account 928,
16 and Automobile Lease expenses were analyzed separately and included in the
17 calculations of the expense lag. Again, the lags for each expense item were computed as
18 the difference between the payment date and the mid-point of the service period.

19 **Q. How was the expense lag calculated for expenses allocated from the Service**
20 **Companies?**

1 A. The expenses allocated from the Service Companies consisted of Labor and Other O&M
2 expenses that are charged to O&M accounts. The expense lag of 37.23 days that is
3 assigned to this expense was computed as the difference between the Cash Pool date,
4 which is the payment date for Service Company charges, and the mid-point of the service
5 period, which is the mid-point of the calendar month being billed.

6 **Q. How is Uncollectible Accounts expense included in the lead-lag study?**

7 A. Uncollectible Accounts expense for base revenues was not assigned lead or lag days in
8 the study because it is a non-cash item. The lag for uncollectible accounts has been
9 recognized in the calculation of the collection lag. The accounts receivable balance is
10 reduced when uncollectible accounts are written off, and therefore, the collection lag is
11 reduced.

12 **Q. Are there Other O&M expenses that were included in the calculation of expense lag?**

13 A. Yes, there are Other O&M expenses directly paid by the Unitil Energy. Because these
14 expenses are made up of thousands of vouchers processed throughout the course of the
15 test year, a sample was used to estimate the lags for each Operating Company. The
16 sample produced a lag of 41.47 days for these Other O&M direct expenses.

17 The sampling method used was a random sequential sample of the population using four
18 (4) strata. The population was sorted by dollar amounts, and the following strata were
19 used for the sample:

20	Stratum 1	–	Largest 25 vouchers
21	Stratum 2	–	Every 5 th voucher down to \$7,500
22	Stratum 3	–	Every 25 th voucher down to \$1,000
23	Stratum 4	–	Every 100 th voucher under \$1,000

1 The resulting sample accounted for 28.4% of the dollars in the population and resulted in
2 a lag of 41.47 days for the Other O&M expenses.

3 **Q. Did you include any other expenses besides O&M expenses in the calculation of the**
4 **expense lag?**

5 A. Yes. Since Property Taxes, Other Taxes, Federal and State Income Taxes, and Interest
6 on Long Term Debt represent cash outlays, they were included in the fiscal 2015 period
7 in the calculation of CWC. All property tax payments made during 2015 were analyzed,
8 and the expense lags computed. Other Taxes consist mostly of Payroll Taxes,
9 Unemployment Taxes, and Other Taxes. Each type of tax was analyzed separately and
10 assigned a lag based on the service periods and payments dates. Federal and State
11 Income Taxes were assigned lags based on the statutory required fiscal tax year equal tax
12 payments. Interest on Long Term Debt was assigned lags based on the actual interest
13 payments for the 2015 fiscal period.

14 **Results of the Unitil Energy System Lead-Lag Study**

15 **Q. Where have you presented the results of the CWC calculations for the pro forma**
16 **test year?**

17 A. The results of the lead-lag study are summarized on page 1 of Attachment PMN-LL-1.
18 This page summarizes the revenue lags from page 2 and the expense lags from page 3
19 and presents the Company's CWC for the test year on a pro forma basis.

20 **Q. Have you identified the net lag days between revenue and expense for Unitil Energy**
21 **for the twelve months ending December 31, 2015 on a pro forma basis?**

1 A. Yes. As indicated by the data on page 1 of Attachment PMN-LL-1, the net lag for CWC
2 is 27.25 days (line 29, column 4). The positive lag indicates that cash working capital is
3 required to compensate for the fact that the lag in the recovery of revenues is greater than
4 the lag in the payment of expenses.

5 On a pro forma basis, Unitil Energy's CWC requirement for the December 31, 2015 test
6 year is \$2,659,152, or 7.466%, as shown on page 1, lines 36 and 39, of the above noted
7 schedule. This CWC requirement represents the capital that must be provided and
8 included as an addition to rate base.

9 **Q. Referring to Attachment PMN-LL-1, page 1 of 3, could you discuss the structure of**
10 **your pro forma lead-lag study summary?**

11 A. The summary of the Unitil Energy lead-lag study consists of three sections. Line 1
12 summarizes the revenue lag from page 2. Lines 3 through 26 detail the expense lag data.
13 Lines 29 to 39 show the net lag and Cash Working Capital requirements and Working
14 Capital percent.

15 In order to compute subtotals and totals, the rightmost working column, labeled "Net Day
16 Weighted Amount," is shown. For those categories with known lag days, this column is
17 the product of the annual expense and the net lag days. For rows displaying subtotals,
18 this column will be computed and then used along with the appropriate figure from the
19 Annual Expense column to compute the average net lag.

20 **Q. Does this conclude your testimony?**

21 A. Yes, it does.