

THE STATE OF NEW HAMPSHIRE  
BEFORE THE  
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

Public Service Company of New Hampshire  
Controlled Water Heating and Load Controlled Service Technical Statement

Docket No. DE 14-XXX

July 29, 2014

**A. Purpose of Technical Statement**

This technical statement is being submitted to explain the proposed changes to Public Service Company of New Hampshire's ("PSNH") Controlled Water Heating ("CWH") and Load Controlled Service ("LCS") rates.

**B. Background Information**

In September 2013, PSNH began an effort to recertify customers taking service under its CWH rate. The CWH rate is a "rider" to the Company's Residential Rates R and R-OTOD and its General Service Rate G. Under the rate, a meter equipped with a time clock provides power to the off-peak element of approved storage type electric water heaters for 17 hours each day. The rate was closed to new locations on September 30, 1981. Existing customers were allowed to remain on the rate for the remaining life of the water heating equipment installed at that time. Tank replacements occurring after September 30, 1981 disqualify the customer from the rate. Prior to the 2013 recertification effort, there were 1,006 customers on the Controlled Water Heating (CWH) rate.

Likewise, at about the same time PSNH began a review of approximately 272 customers receiving space and/or water heating service under the 8-, 10- and 11-hour options of the LCS rate. The LCS rate is also a "rider" and must be taken in conjunction with service under Rate R or Rate G. These options were closed to new locations on October 1, 2004. Time clock meters are also used to limit the hours of service available under these rate options.

As of July 22, 2014, of the original 1,006 accounts on the CWH rate, only 374 remain. Most of the 632 customers removed from the rate were disqualified due to tank replacements occurring after September, 1981. These customers were transferred to service under PSNH's Un-Controlled Water Heating rate. Also, 162 'zero use' meters were removed. Most of these customers had removed their electric water heaters, leaving no load behind the meter. Approximately 20 accounts left the rate through normal attrition. Of the 374 customers remaining on the rate, 95 have been re-qualified and 216 have offered no response to multiple attempts to make contact. The status of the remaining 63 accounts is inconclusive, meaning that

the information returned to PSNH was incomplete and attempts to complete an on-site inspection were unsuccessful. PSNH will continue to try to communicate with these customers to verify that they qualify for the rate.

Additionally, PSNH has identified 22 “zero use” LCS accounts and has attempted to reach these customers by phone. As of July 23, 2014, only five of these meters have been removed. PSNH will continue its attempts to reach these customers and remove as many meters as possible where there is no longer load behind the meter.

For those customers who remain on the CWH or LCS rates, most of the time clock meters used for these rates were built prior to 1990 (many prior to 1980) and are at the end of their useful lives. Most of these meters are used to control water heater loads. Some are used to control both storage heat and hot water loads.

Many meters are used to control the load current directly, requiring a relay rating up to 30A. Even those used to control loads indirectly have relays that may need to switch several amps of current. Continued proper operation of the load control switch mechanism has become problematic in some meters, although the metering function is also showing signs of degradation for the 30-year-old meters. As a result, these meters should be replaced.

As the water heating rate recertification project progressed and regular communications between the Rates Department, Customer Service and Meter Engineering continued, it became evident that finding a suitable replacement for the traditional time clock meter was not only a matter of economy, but of availability.

Research by PSNH’s Meter Engineering group revealed that none of the four major meter manufacturers PSNH works with actually make a replacement meter with a time-based load control switch suitable for direct load control. Discussions with manufacturers’ representatives have shown that no meter manufacturer is willing to develop a replacement meter for the low volume installations PSNH would be looking to replace. Accordingly, other options and solutions are required.

### **C. Available Options**

#### **Option 1**

One socket manufacturer (Marwell) offers a socket adapter/extender with a high current relay mounted inside to replicate the function of the older style mechanical meters with built-in relays. This adapter, however, still requires the meter to have a time-controlled relay rated for 240V operation to control the high current relay in the adapter. Unfortunately, the meter relay is only rated for 120V (0.1A maximum).

While it is theoretically possible to employ a 120V relay in the adapter, it would require PSNH to make an external connection to the system neutral inside the socket. There is no neutral reference inside the adapter or in a Form 2S residential type meter. It is prohibitively difficult, impractical, and potentially dangerous to modify the adapter relay control wiring to gain access to the service neutral wire and make a secure (but separable) connection between the neutral inside the socket and the relay connections inside the adapter and meter.

If PSNH were to risk attempting such a connection, it may require changing older type sockets, and possibly adding a second adapter as a spacer to accommodate the extra wiring and connections required. The result would be a stack of 2 adapters and a meter extending outward from the socket that would not be attractive to any customer and would be very difficult to work with during meter exchanges. There would be a high risk of pinching wires, and such installations would likely require two people to coordinate the removal and installation of the meter/adapter stack. Such an extension would also be at a higher risk of getting knocked off the socket or interfering with those that may need to walk close to such an installation. The installation would be expensive, unattractive, disruptive to the customer, cumbersome, and hazardous to work with any time a future meter change would be required (testing, failures, etc.).

The total cost of deploying this meter configuration in the field is roughly \$530.00 per meter.

### **Option 2**

PSNH could continue to use the time clock meters at the locations where customers have been recertified and use meters removed from disqualified locations as back stock. As stated above, however, these meters are approaching the end of their useful lives, and this option would continue to require physical meter readings each month, regardless of any changes that might be made to the metering technology.

Furthermore, after considering the option of re-using existing meters PSNH has determined that many of the time clock mechanisms may not be functioning properly today, and that the metering function could possibly be degraded in some of the in-service meters.

### **Option 3**

PSNH could install a standard meter at the remaining CWH and LCS 8-, 10- and 11-hour locations as part of PSNH's larger meter replacement project and allow the customers to remain on the discounted rates as long as they qualify, without time controls. This option is by far the lowest cost option, roughly \$40.00 per meter, and would not have any negative impact on customers. Since many of the current meters may not be functioning properly, and since PSNH has significantly reduced the number of customers on these rates, the elimination of time controls will not adversely affect the Company.

#### **D. Summary and Proposal**

Based on the above, installing standard meters at the remaining 374 CWH and 272 LCS accounts would cost approximately \$23,900, compared to \$342,380 for the adapters described in Option 1. Thus, a less than optimum approach (Option 1) to metering these customers, would cost the Company nearly \$350,000, would result in an installation that would prove expensive, cumbersome and potentially dangerous to work with, disruptive and unattractive to the customer.

Redeploying currently installed time clock meters to recertified locations (Option 2) is beyond consideration because the controls on many of these meters are not working correctly and overall functionality may be degraded.

Accordingly, PSNH is recommending that it install standard AMR meters (Option 3) at these locations, which would cost less than \$25,000 and would be completed as part of PSNH's wider meter conversion project. The customers would see a newer meter, but would see no change to their billing as they would be allowed to stay on the rate until they no longer qualified. Although the customers would see no change in their billing, the time restrictions noted in the rates would no longer apply. PSNH will continue its efforts to reduce the number of customers on these closed rates in anticipation of eliminating these rates in a future distribution rate case.

PSNH is requesting the Commission's approval of its proposal to replace the remaining CWH and LCS time clock meters with standard meters. For illustrative purposes, we are supplying proposed tariff pages from which references to time switches and the hours that service is available under these options has been removed.

NHPUC NO. 8 - ELECTRICITY DELIVERY

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

9th<sup>8th</sup>-Revised Page 42  
Superseding 8th<sup>7th</sup> Revised Page 42  
Rate R

#### WATER HEATING - UNCONTROLLED

Uncontrolled water heating service is available under this rate when such service is supplied to approved water heaters equipped with either (a) two thermostatically-operated heating elements, each with a rating of no more than 5,500 watts, so connected or interlocked that they cannot operate simultaneously, or (b) a single thermostatically-operated heating element with a rating of no more than 5,500 watts. The heating elements or element shall be connected by means of an approved circuit to a separate water heating meter. Delivery Service measured by this meter will be billed monthly as follows:

Meter Charge ..... \$4.36 per month

##### Energy Charges:

Distribution Charge..... 1.981¢ per kilowatt-hour

Transmission Charge ..... 1.381¢ per kilowatt-hour

Stranded Cost Recovery.....-0.225¢ per kilowatt-hour

#### WATER HEATING - CONTROLLED

Controlled off-peak water heating is available under this rate for a limited period of time at those locations which were receiving controlled off-peak water heating service hereunder on Customer Choice Date and which have continuously received such service hereunder since that date. Service under this rate at such locations shall continue to be available only for the remaining life of the presently-installed water heating equipment. No replacement water heaters shall be permitted to be installed for service under this rate at locations which otherwise would qualify for this service.

For those locations which qualify under the preceding paragraph, controlled off-peak water heating service is available under this rate when such service is supplied to approved storage type electric water heaters having an off-peak heating element with a rating of no more than 1,000 watts, or 20 watts per gallon of tank capacity, whichever is greater. The off-peak element shall be connected by means of an approved circuit to a separate water heating meter, ~~equipped with a time switch which makes energy available for 17 hours each day.~~ Electricity used will be billed monthly as follows:

Meter Charge ..... \$7.69 per month

##### Energy Charges:

Distribution Charge..... 0.118¢ per kilowatt-hour

Transmission Charge ..... 1.381¢ per kilowatt-hour

Stranded Cost Recovery.....-0.199¢ per kilowatt-hour

Issued: July 2, 2014

Issued by: /s/ William J. Quinlan  
William J. Quinlan

Effective: July 1, 2014

Title: President and Chief Operating Officer

NHPUC NO. 8 - ELECTRICITY DELIVERY  
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

Superseding 7<sup>th</sup> 8<sup>th</sup> Revised Page 46  
Rate R-OTOD

### CAPACITY CHARGE

The Company's studies may show that, in order to more closely follow cost of service, it is necessary or desirable to utilize meters capable of measuring rate of taking of electric service in kilowatts. The Company may install such meters either for all Customers served under this rate or for only those Customers whose usage of electricity is uncharacteristic of this class. At any time, the Company may file a revision of the rate form and/or charges of this rate to provide for an appropriate capacity charge. After such revision of this rate, any Customer who is subject to higher billing under this rate will have the option of continuing to take service under this rate or to take service under any other rate of the Company's Tariff which may be available.

### WATER HEATING - UNCONTROLLED

Uncontrolled water heating service is available when such service is supplied to approved water heaters equipped with either (a) two thermostatically-operated heating elements, each with a rating of no more than 5,500 watts, so connected or interlocked that they cannot operate simultaneously, or (b) a single thermostatically-operated heating element with a rating of no more than 5,500 watts. The heating elements or element shall be connected by means of an approved circuit to a separate water heating meter. Service measured by this meter will be billed monthly as follows:

Meter Charge .....\$4.36 per month

Energy Charges:

Distribution Charge..... 1.981¢ per kilowatt-hour  
Transmission Charge ..... 1.381¢ per kilowatt-hour  
Stranded Cost Recovery.....-0.225¢ per kilowatt-hour

### WATER HEATING - CONTROLLED

Controlled off-peak water heating is available under this rate for a limited period of time at those locations which were receiving controlled off-peak water heating service hereunder on Customer Choice Date and which have continuously received such service hereunder since that date. Service under this rate at such locations shall continue to be available only for the remaining life of the presently-installed water heating equipment. No replacement water heaters shall be permitted to be installed for service under this rate at locations which otherwise would qualify for this service.

For those locations which qualify under the preceding paragraph, controlled off-peak water heating service is available under this rate when such service is supplied to approved storage type electric water heaters having an off-peak heating element with a rating of no more than 1,000 watts, or 20 watts per gallon of tank capacity, whichever is greater. The off-peak element shall be connected by means of an approved circuit to a separate water heating meter-equipped with a time switch which makes energy available for 17 hours each day. Electricity used will be billed monthly as follows:

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PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

9th<sup>8th</sup>-Revised Page 52  
Superseding 8th<sup>7th</sup> Revised Page 52  
Rate G

date. Service under this rate at such locations shall continue to be available only for the remaining life of the presently-installed water heating equipment. No replacement water heaters shall be permitted to be installed for service under this rate at locations which otherwise would qualify for this service.

For those locations which qualify under the preceding paragraph, controlled off-peak water heating service is available under this rate when such service is supplied to approved storage type electric water heaters having an off-peak heating element with a rating of no more than 1,000 watts, or 20 watts per gallon of tank capacity, whichever is greater. The off-peak element shall be connected by means of an approved circuit to a separate water heating meter ~~equipped with a time switch which makes energy available for 17 hours each day.~~ Electricity used will be billed monthly as follows:

Meter Charge.....\$7.69 per month

Energy Charges:

Distribution Charge..... 0.118¢ per kilowatt-hour

Transmission Charge ..... 1.381¢ per kilowatt-hour

Stranded Cost Recovery.....-0.199¢ per kilowatt-hour

SPACE HEATING SERVICE

Space heating service is available under this rate at those locations which were receiving space heating service under the Transitional Space Heating Service Rate TSH prior to Customer Choice Date and which have continuously received such service since that date. Customers at such locations who have elected this rate shall have the electricity for such service billed separately on a monthly basis as follows:

Meter Charge.....\$2.91 per month

Energy Charges:

Distribution Charge..... 3.344¢ per kilowatt-hour

Transmission Charge ..... 1.663¢ per kilowatt-hour

Stranded Cost Recovery.....-0.242¢ per kilowatt-hour

Space heating equipment served under this rate, including heat pumps and associated air circulating equipment, shall be wired by means of approved circuits to permit measurement of such equipment's additional demand and energy use.

Issued: July 2, 2014

Issued by: /s/ William J. Quinlan  
William J. Quinlan

Effective: July 1, 2014

Title: President and Chief Operating Officer



NHPUC NO. 8 - ELECTRICITY DELIVERY  
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

Original-1<sup>st</sup> Revised Page 57  
Superseding Original Page 57  
Rate LCS

## LOAD CONTROLLED DELIVERY SERVICE RATE LCS

### AVAILABILITY

Subject to the Terms and Conditions of the Tariff of which it is a part and as provided hereinafter, the radio-controlled option of this rate is available for separately metered and controlled Delivery Service to electric thermal storage devices and to conventional electric space heating when a dynamic electric thermal storage system or a wood stove or coal stove is available for use as a backup during times when service is interrupted by the Company and other applications approved by the Company. Service under the 8-hour, 10-hour and 11-hour options is available only at those locations which were receiving service under one of these options under Load Controlled Service Rate LCS or Controlled Off-Peak Electric Water Heating Service Rate COPE on October 1, 2004 and which have continuously received such service since that date.

The availability of the radio-controlled option in conjunction with a wood stove or coal stove shall be limited to those premises which have electric space heating equipment as the sole source of space heating, excluding the wood stove or coal stove. Such wood stove or coal stove must be permanently installed and sized to adequately heat the main living area of the premises.

Service under this rate is available at the Customer's option to those Customers whose electric thermal storage or other equipment has been approved by the Company for load control as provided hereinafter. Such equipment must be connected to a separate circuit to which no other electrical load shall be connected.

Radio-Controlled Option - Delivery service will be subject to interruptions of up to eight (8) hours during each twenty-four (24) hour day between 7:00 a.m. and 11:00 p.m. Each interruption will not exceed four (4) hours and the time between two consecutive interruptions will be no less than two (2) hours.

~~8-Hour Option - Delivery Service will be available for eight (8) nighttime hours determined by the Company during each twenty-four (24) hour day.~~

~~10-Hour Option - Delivery Service will be available for eight (8) nighttime hours and two (2) shoulder hours as determined by the Company, during each twenty-four (24) hour day.~~

~~11-Hour Option - Delivery Service will be available for eleven (11) hours determined by the Company during each twenty-four (24) hour day.~~

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Issued by: Gary A. Long William J. Quinlan

Effective: July 1, 2010

Title: President and Chief Operating Officer



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9th Revised Page 42  
Superseding 8th Revised Page 42  
Rate R

#### WATER HEATING - UNCONTROLLED

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Energy Charges:

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PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

9<sup>th</sup> Revised Page 46  
Superseding 8<sup>th</sup> Revised Page 46  
Rate R-OTOD

CAPACITY CHARGE

The Company's studies may show that, in order to more closely follow cost of service, it is necessary or desirable to utilize meters capable of measuring rate of taking of electric service in kilowatts. The Company may install such meters either for all Customers served under this rate or for only those Customers whose usage of electricity is uncharacteristic of this class. At any time, the Company may file a revision of the rate form and/or charges of this rate to provide for an appropriate capacity charge. After such revision of this rate, any Customer who is subject to higher billing under this rate will have the option of continuing to take service under this rate or to take service under any other rate of the Company's Tariff which may be available.

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9th Revised Page 52  
Superseding 8th Revised Page 52  
Rate G

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Space heating equipment served under this rate, including heat pumps and associated air circulating equipment, shall be wired by means of approved circuits to permit measurement of such equipment's additional demand and energy use.

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NHPUC NO. 8 - ELECTRICITY DELIVERY  
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1<sup>st</sup> Revised Page 57  
Superseding Original Page 57  
Rate LCS

## LOAD CONTROLLED DELIVERY SERVICE RATE LCS

### AVAILABILITY

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The availability of the radio-controlled option in conjunction with a wood stove or coal stove shall be limited to those premises which have electric space heating equipment as the sole source of space heating, excluding the wood stove or coal stove. Such wood stove or coal stove must be permanently installed and sized to adequately heat the main living area of the premises.

Service under this rate is available at the Customer's option to those Customers whose electric thermal storage or other equipment has been approved by the Company for load control as provided hereinafter. Such equipment must be connected to a separate circuit to which no other electrical load shall be connected.

Radio-Controlled Option - Delivery service will be subject to interruptions of up to eight (8) hours during each twenty-four (24) hour day between 7:00 a.m. and 11:00 p.m. Each interruption will not exceed four (4) hours and the time between two consecutive interruptions will be no less than two (2) hours.

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