

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
PUBLIC UTILITIES COMMISSION

IN RE: THE NARRAGANSETT ELECTRIC :  
COMPANY D/B/A NATIONAL GRID STREET : DOCKET NO. 4513  
LIGHT METERING PILOT PROPOSAL :

REPORT AND ORDER

At an Open Meeting on July 25, 2014, the Public Utilities Commission (PUC) ordered The Narragansett Electric Company d/b/a/ National Grid (National Grid) to submit, for PUC review, a pilot metering program for municipal-owned streetlights to be filed on or before October 23, 2014.<sup>1</sup> National Grid was ordered to engage with the municipalities as part of the development of the pilot so as to appropriately identify those that may be ready, willing, and able to proceed with participation and, as necessary, to identify the types of meters that may be appropriate for the pilot. The proposed pilot was to include evidence that National Grid did engage the Municipalities.<sup>2</sup>

The PUC directed that the proposal was not to assume meter ownership on the part of either party. At a minimum, it should include the technical issues that would need to be addressed, such as interfacing with National Grid's billing system, the types of meters that would be compatible, and access issues. While the PUC noted, it might be reasonable to aspire to having municipalities in different geographic areas participate in the pilot, this should not be a barrier to entry for municipalities up to the participation rate. The goals of the pilot should include, at a minimum, gauging meter accuracy, integration with the billing system, a comparison to the unmetered rates, and cost allocation.<sup>3</sup>

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<sup>1</sup> Open Meeting Minutes Jul. 25, 2014; <http://www.ripuc.org/eventsactions/minutes/072514.pdf>.

<sup>2</sup> The Municipalities are comprised of the Rhode Island League of Cities and Towns and the Washington County Regional Planning Council.

<sup>3</sup> Order No. 21704, 44-46 (issued October 31, 2014); [http://www.ripuc.org/eventsactions/docket/4442-NGrid-Ord21704\\_10-31-14.pdf](http://www.ripuc.org/eventsactions/docket/4442-NGrid-Ord21704_10-31-14.pdf), stated:

Despite the fact that the PUC found that the evidence in the record did not support a finding of significant savings from metering, the PUC recognized that the cities and towns believe they will be able to achieve sufficient additional savings through investment in metering technology at the same time as a change-out of the lighting controls.

On October 23, 2014, National Grid filed a street light metering pilot proposal to include the study of at least two light control modules with laboratory testing and testing by a municipality at a cost of \$1.1 million to \$3.1 million, depending on ownership of the luminaire equipment used in the pilot. The timetable for completion of the pilot was fifty-four weeks from approval by the PUC. National Grid set forth four tasks to be accomplished with the pilot: (1) evaluation of the meter manufacturer's laboratory test results; (2) confirmation of the manufacturer's claims through testing by National Grid in a controlled environment; (3) evaluation of the technical and communication capabilities of each meter; and (4) field testing of successful meters as compared to traditional ones. National Grid anticipated participation of four municipalities in the field testing with 2000 company-provided street light control nodes. Silver Spring Networks, Inc. would be used for networking to provide endpoint monitoring, management and reporting, network management, and remote firmware upgrades. At the conclusion of the pilot, National Grid planned to remove the equipment used in the pilot and reinstall whatever had been removed for the pilot. According to National Grid, it had sought input from Municipalities through a meeting and the use of an online survey.<sup>4</sup>

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Furthermore, the PUC appreciated the Municipalities' contention that if they will own the meters, it would be more cost effective to install a control device with a metering component at the outset, rather than having to retrofit the control device. Therefore, in response to this expectation, the PUC opened a new docket and ordered National Grid to develop and file with the PUC a pilot program within 90 days, or by October 23, 2014, a pilot program with municipal participation.

The PUC's jurisdiction to order such a pilot stems from its statutory mandate to ensure that the rates it sets are just and reasonable and from the stated purposes of the statute, namely that the municipal lighting costs should be reduced by "providing innovative and proven technologies for more efficient lighting."<sup>3</sup> While seemingly oxymoronic to refer to proven and innovative technologies, the phrase aptly describes the replacement of old lights with LEDs. LEDs are innovative, indeed undergoing constant improvement. But they are also proven, having been around for more than fifty years. Similarly, customers and utilities have long been familiar with meters. But the technology as it relates to streetlighting, as a component of the photo control, is innovative and to some extent unproven in most of the United States. Therefore, establishing a pilot program is the most appropriate course of action to balance the interests of all parties.

<sup>4</sup> Street Light Metering Pilot Proposal at 2-3, 7-8, 9 [http://www.ripuc.org/eventsactions/docket/4513-NGridMeteringPilot\(10-23-14\).pdf](http://www.ripuc.org/eventsactions/docket/4513-NGridMeteringPilot(10-23-14).pdf); National Grid Response to PUC-1-7 [http://www.ripuc.org/eventsactions/docket/4513-NGrid-DR-PUC1\(11-21-14\).pdf](http://www.ripuc.org/eventsactions/docket/4513-NGrid-DR-PUC1(11-21-14).pdf).

On October 30, 2014, the Municipalities filed an objection to the proposed pilot, contending that both the scope and cost were excessive. Prefiled testimony was subsequently filed by both National Grid and the Municipalities. On January 7, 2015, the Division of Public Utilities and Carriers (Division) submitted a memorandum from its consultant, Richard Hahn. Mr. Hahn generally supported the Company's proposal, but recommended eliminating installation of parallel metering using Encoder, Transmitter, and Receiver meters, the current technology in use by National Grid. He also recommended a reduction in the number of luminaires to be installed as part of the pilot. He suggested additional modifications to assist municipalities in participating in the pilot.<sup>5</sup> On January 22, 2015, the parties filed a joint request for an extension of time of the procedural schedule, to allow the parties to attempt to resolve their differences.<sup>6</sup>

On March 24, 2015, National Grid filed a revised pilot proposal, proposing to partner with the Rhode Island Department of Transportation (DOT) for much of the field testing, using infrastructure that DOT was already evaluating in their own pilots.<sup>7</sup> Also, the Company planned to investigate other utility managed network controlled street lighting infrastructure applications.<sup>8</sup> National Grid still expected a minimum of twelve months for the pilot.<sup>9</sup> The Company planned to conduct lab testing at the same time measurements were obtained from the DOT pilots.<sup>10</sup> The Company then planned to use various applications to address conditions not present in the DOT pilots.<sup>11</sup> Throughout, National Grid would evaluate whether the equipment used in the pilot should

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<sup>5</sup> Hahn Mem., 1-6 [http://www.ripuc.org/eventsactions/docket/4513-DPU-Comments\\_1-7-15.pdf](http://www.ripuc.org/eventsactions/docket/4513-DPU-Comments_1-7-15.pdf).

<sup>6</sup> Joint Request for an Extension of Time [http://www.ripuc.org/eventsactions/docket/4513-Municipals-Request\(1-22-14\).pdf](http://www.ripuc.org/eventsactions/docket/4513-Municipals-Request(1-22-14).pdf).

<sup>7</sup> Revised Street Light Metering Pilot Proposal at 3 [http://www.ripuc.org/eventsactions/docket/4513-NGrid-RevMeteringPilot\(3-24-15\).pdf](http://www.ripuc.org/eventsactions/docket/4513-NGrid-RevMeteringPilot(3-24-15).pdf).

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

remain in place at the conclusion.<sup>12</sup> National Grid stated that its proposal does not address ownership of the equipment used in the pilot as previously directed by the Commission.<sup>13</sup>

National Grid's proposed pilot was divided into two stages, each of which was divided into two phases.<sup>14</sup> Stage 1 – Phase 1 involves Integrated Circuit meter laboratory verification testing.<sup>15</sup> Stage 1 – Phase 2 involves Integrated Circuit meter and communication network field application testing.<sup>16</sup> Stage 2 – Phase 1 involves impact assessment of information system integration.<sup>17</sup> Stage 2 – Phase 2 involves comparative analysis of metered and unmetered computations.<sup>18</sup> After laboratory testing the meter equipment, the Company will begin receiving data from the DOT pilot programs.<sup>19</sup> The Company proposed to expose the devices and communications network systems to diverse functional and operational scenarios.<sup>20</sup> Also, during testing, participants would be able to use the network to alter the schedule and output of the lights.<sup>21</sup>

In Stage 2, the Company planned to identify what is necessary for the data transmitted from the systems to be compatible with the Company's data management and billing systems.<sup>22</sup> The Company would then compare all the meter data with preexisting energy consumptions calculations to "further investigate the value of implementing and utilizing this metering technology and communication system to achieve more accurate billing."<sup>23</sup>

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<sup>12</sup> *Id.*

<sup>13</sup> *Id.* at 4.

<sup>14</sup> *Id.* at 5.

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *Id.* at 6.

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> *Id.* at 7.

As part of the pilot, National Grid proposed to test several Integrated Circuit meter devices from different manufacturers, since the network-control technology may be unique to a specific manufacturer.<sup>24</sup> The Company also planned to use two network communication platform providers, which were predetermined in an effort to meet the pilot's schedule.<sup>25</sup> One of the two manufacturers, Cimcon, already had a contractual service agreement with DOT as part of its pilot programs.<sup>26</sup> National Grid would then establish a separate relationship with Cimcon. The Company would likewise contract with the other manufacturer, Silver Springs Network.<sup>27</sup>

Throughout the pilot, National Grid would evaluate multiple security issues associated with the metering technology, using preexisting company policies.<sup>28</sup> The Company also planned to use meters that meet the Division Rules Prescribing Standards for Electric Utilities. The rules set minimum meter accuracy at 98%, though the Company also proposed to test meters that purport to be 99.5% accurate as part of the pilot.<sup>29</sup>

Rather than four municipalities, National Grid proposed to select a single municipality that could simultaneously meet the pilot's goals while keeping within cost and schedule parameters.<sup>30</sup> The Company planned to select the municipality based on its geography, topography, and varied street lighting applications.<sup>31</sup> Also, National Grid's proposal to partner with DOT would provide data from one intersection on I-295 along a span of highway and at several park-and-ride

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<sup>24</sup> *Id.* at 8.

<sup>25</sup> *Id.*

<sup>26</sup> *Id.* at 9.

<sup>27</sup> *Id.* at 10.

<sup>28</sup> *Id.* at 10-11.

<sup>29</sup> *Id.* at 12.

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

locations.<sup>32</sup> In addition, the Company would partner with independent consultants for expertise and oversight.<sup>33</sup>

On March 26, 2015, the Municipalities filed an objection to National Grid's proposed plan, again arguing that the proposed pilot exceeded the scope needed to answer the PUC's questions and is designed to support National Grid's ownership of meters.<sup>34</sup> While the Municipalities had no objection to Stage 1 – Phase 1's laboratory testing, they contended that Stage 2 – Phase 2's field testing was excessively expansive, placing more costs on streetlight customers than is necessary.<sup>35</sup> The Municipalities stated, "Meter accuracy is adequately tested with laboratory testing and DOT Phase 1's . . . lights."<sup>36</sup> Anything beyond this, they initially claimed, is unnecessary to test meter accuracy. Also, the Municipalities thought that while testing metering chips with 99.5% accuracy should be reported, that testing should not determine acceptability, as the Division's standard of 98% is already more accurate than the unmetered system.<sup>37</sup>

The Municipalities also objected to National Grid's proposal to receive all controller consumption data, averring it was beyond the scope needed to integrate the systems into the Company's billing system.<sup>38</sup> The Municipalities instead asked that National Grid receive only aggregated data.<sup>39</sup> Also, while National Grid brought up real concerns that can arise in designing

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<sup>32</sup> *Id.* at 14.

<sup>33</sup> *Id.* at 13.

<sup>34</sup> Municipalities Objection (Mar. 25, 2014) [http://www.ripuc.org/eventsactions/docket/4513-Municipals-Objection-NGrid-RevTariff\\_3-25-14.pdf](http://www.ripuc.org/eventsactions/docket/4513-Municipals-Objection-NGrid-RevTariff_3-25-14.pdf).

<sup>35</sup> *Id.* at 3.

<sup>36</sup> *Id.* Initially, the Municipalities believed that the DOT Phase 1 study at Exit 7 of I-295 allowed for a sufficient comparison of traditional meters, intelligent controllers, and unmetered rates, already going beyond the Commission's expectation at essentially no cost. *Id.* at 5. This position was expanded to include the DOT Phase 2 study in their response to the Division Memorandum. See *infra* note 60, at 1.

<sup>37</sup> Municipalities Objection at 3-4.

<sup>38</sup> *Id.* at 4.

<sup>39</sup> *Id.*

a wireless streetlight control system, the Municipalities asserted that these issues are independent of whether or not to use metering chips for billing.<sup>40</sup>

Additionally, because intelligent streetlight controllers are not technically viable in many rural communities, the Municipalities believed that those communities should not be subsidizing a pilot program that would eventually be of no use to them.<sup>41</sup> Considering the cost factors compared with municipal budgets, the Municipalities maintained that this pilot should be limited to its “absolute minimum scope and cost.”<sup>42</sup>

While the Municipalities had no objection to a municipal field test in principle, they saw no incentive for any municipality to participate due to cost issues.<sup>43</sup> Likewise, the Municipalities mentioned a similar system being installed in Randolph, Massachusetts, which is within Massachusetts Electric’s (another National Grid company) service area.<sup>44</sup> Randolph has offered to have its system monitored as part of the pilot, which the Municipalities proposed in meetings, but National Grid rejected.<sup>45</sup>

The Municipalities also claimed that National Grid’s proposal was skewed towards the Company owning the streetlight controller system, thus violating the PUC’s order that the proposal not assume ownership.<sup>46</sup> The Municipalities argued that the broad scope of the pilot would provide enough information to National Grid for it to design a statewide controller system that it would then own.<sup>47</sup> The Municipalities pointed to National Grid’s proposal to investigate only utility-

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<sup>40</sup> *Id.* at 4-5.

<sup>41</sup> *Id.* at 5.

<sup>42</sup> *Id.* at 5-6.

<sup>43</sup> *Id.* at 6.

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* at 6-7.

<sup>47</sup> *Id.* at 7.

managed systems, coupled with its refusal to consider data from Randolph as proof of the bias towards the Company owning the metering system.<sup>48</sup>

On April 30, 2015, the Division filed a memorandum from Mr. Hahn addressing two questions the PUC posed to the Division. First, Mr. Hahn stated that he does not believe that the pilot program is biased towards National Grid owning the metering system.<sup>49</sup> Instead, he sees the mention in National Grid's proposal of management by a utility as a non-essential part of the document.<sup>50</sup> Second, Mr. Hahn stated the pilot was not overbroad.<sup>51</sup> Phase 1 of the DOT pilot program only addresses the intersection of two major highways, which he believes would be different from systems used on local roads and streets.<sup>52</sup> Thus, the pilot program proposed will gather the data necessary to evaluate not just the needs of the DOT, but also of the Municipalities.<sup>53</sup>

On April 30, 2015, the Office of Energy Resources (OER) filed a response to a PUC request for OER's position on several aspects of the pilot program. First, OER did not believe that the inclusion of a municipality would provide a significant benefit beyond the data provided by the DOT pilot programs, especially in light of the costs to the selected municipality.<sup>54</sup> Instead, the OER believed that the data from DOT's Phase 1 and Phase 2 projects would provide more than enough data to test meter accuracy.<sup>55</sup> Also, OER stated that including DOT Phase 3 program at park-and-ride locations would not provide any meaningful data and should be removed from the pilot.<sup>56</sup> OER urged further consideration of using data from the Randolph, Massachusetts program

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<sup>48</sup> *Id.*

<sup>49</sup> Hahn Mem. at 1; [http://www.ripuc.ri.gov/eventsactions/docket/4513-DPU-Memo\\_4-30-15.pdf](http://www.ripuc.ri.gov/eventsactions/docket/4513-DPU-Memo_4-30-15.pdf).

<sup>50</sup> *Id.*

<sup>51</sup> *Id.*

<sup>52</sup> *Id.* at 2.

<sup>53</sup> *Id.*

<sup>54</sup> Office of Energy Resources's Letter to PUC at 1; [http://www.ripuc.ri.gov/eventsactions/docket/4513-OER-Letter\(04-30-15\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/4513-OER-Letter(04-30-15).pdf).

<sup>55</sup> *Id.*

<sup>56</sup> *Id.*

should the Commission determine municipal field testing critical.<sup>57</sup> Second, OER had no concerns with National Grid's proposed cost recovery methodology.<sup>58</sup> Third, OER did not agree that the pilot was biased towards utility ownership of the metering system.<sup>59</sup>

On May 5, 2015, the Municipalities filed a response to the Division's April 30, 2015 filing. First, after learning more details of the DOT Phase 2 program, the Municipalities changed their position on Phase 2, as Phase 2 will include technology from both Cimcon and Silver Springs Network, the two manufacturers whose products would be used in the pilot.<sup>60</sup> Likewise, the Municipalities contended that the Division's consultant ignored the DOT Phase 2 program as being a possible supplement to the DOT Phase 1 program, thus improperly concluding that a municipality needs to be included.<sup>61</sup> The Municipalities stated this ignores how to address the Commission's concerns at the least possible cost.<sup>62</sup> Second, the Municipalities addressed the Division's consultant's answer to the Commission's question addressing the scope of the pilot program.<sup>63</sup> The Municipalities argued that the consultant went beyond the question because the Commission did not ask for comparisons of unmetered and metered street lights in its question.<sup>64</sup>

Following a status conference with the parties to discuss the DOT pilot phases and narrow the primary issues in dispute, PUC staff issued data requests to National Grid, the Municipalities, and OER for final positions on the scope of the DOT phases that need to be included in the pilot, the need for municipality involvement, and updated cost estimates both with and without a

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<sup>57</sup> *Id.*

<sup>58</sup> *Id.* at 2.

<sup>59</sup> *Id.*

<sup>60</sup> The Rhode Island League of Cities and Towns and Washington County Regional Planning Council's Response to the Division's Memorandum at 1; [http://www.ripuc.ri.gov/eventsactions/docket/4513-Municipals-Reply-DPU\(5-5-15\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/4513-Municipals-Reply-DPU(5-5-15).pdf).

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 1-2.

<sup>63</sup> *Id.* at 1.

<sup>64</sup> *Id.*

municipality. While National Grid continued to assert that a municipality was necessary to provide a sufficiently robust analysis, particularly allowing for the use of multiple communication service providers and meter and node manufacturers,<sup>65</sup> the Municipalities and OER argued that DOT Phases One through Three would be sufficient where Phase Three in the park-and -rides adds the ability to test operational capabilities in areas where roadway safety will not be affected.<sup>66</sup> The cost of the National Grid pilot, including all three phases of the DOT pilot but without participation of a municipality, was estimated at \$246,000.<sup>67</sup>

At an Open Meeting held on July 1, 2015, the PUC considered the positions of the parties and unanimously found that the three phases of the DOT pilot would be sufficient to meet the requirements of PUC Order No. 21704. Inclusion of municipalities was contained in that order because the PUC believed that the municipalities wished to be involved. However, the PUC recognizes that cost is a dissuading factor and is reluctant to require municipal participation. Excluding municipality participation almost halves the cost of the pilot. While it would be beneficial to review multiple communications service providers and associated hardware for a full evaluation, a pilot, by its very nature, is a limited study to determine the feasibility of a concept.

Referencing the revised street light pilot proposal, the PUC noted that each phase of the DOT pilot will allow analysis of different components. Phase one, located at the cloverleaf at Exit 7 of Interstate 295 at U.S. Route 44, will allow for the testing of four luminaire manufacturers with a Cimcon device deployed on each luminaire. Phase two, at Rhode Island Route 146 and Interstate 295, will include a linear profile of a highway involving 1,559 street lights. The physical logistics

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<sup>65</sup> National Grid Response to Data Request PUC-2-1; [http://www.ripuc.org/eventsactions/docket/4513-NGrid-DR-PUC2-3\(6-25-15\).pdf](http://www.ripuc.org/eventsactions/docket/4513-NGrid-DR-PUC2-3(6-25-15).pdf).

<sup>66</sup> Municipalities Response to Data Request PUC 2-1; [http://www.ripuc.org/eventsactions/docket/4513-Municipalities-DR-PUC2\\_6-12-15.pdf](http://www.ripuc.org/eventsactions/docket/4513-Municipalities-DR-PUC2_6-12-15.pdf); OER Response to Data Request PUC 1-1, 1-2; [http://www.ripuc.org/eventsactions/docket/4513-OER-DR-PUC1\\_6-19-15.pdf](http://www.ripuc.org/eventsactions/docket/4513-OER-DR-PUC1_6-19-15.pdf).

<sup>67</sup> National Grid Response to Data Request PUC-3-1; [http://www.ripuc.org/eventsactions/docket/4513-NGrid-DR-PUC2-3\(6-25-15\).pdf](http://www.ripuc.org/eventsactions/docket/4513-NGrid-DR-PUC2-3(6-25-15).pdf).

of these locations promote the testing of the network mesh and/or gateway applications relative to information transmitted between concentrated sites. Finally, phase three taking place in ten park-and-ride locations with a total of ninety-two lights represents unique groups of street lights for the purpose of field testing the management of the lighting operation at each site. This portfolio of different operating schedules provides the Company with a greater variation of energy consumption data to evaluate integrated circuit meter performance.<sup>68</sup>

The PUC found that a wealth of information could be gathered and analyzed by National Grid to meet one important goal of PUC Order No. 21704: comparing metered to unmetered rates. The pilot should also provide information on meter accuracy. Of further interest is the ability to integrate the information into the billing system, even if not fully automated. Information gleaned from this pilot should also provide the PUC with important information to determine if all lighting customers could benefit from the ownership of controls and/or the use of controls that include technology allowing for the measurement of usage. Ultimately, this information could inform the PUC of the practicality of further investigating whether street lighting customers should be allowed to provide the measurement data to National Grid for billing purposes.

National Grid proposed to recover the costs associated with the metering pilot from all street lighting customers. Because jurisdiction for ordering this pilot originated from the PUC's obligation to ensure that the unmetered rates are reasonable proxies for metered rates for all street lighting customers, the PUC approved this approach. All street lighting customers will benefit from the results of the pilot, not just those cities and towns who choose to purchase their lights.

Accordingly, it is hereby

(22413) ORDERED:

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<sup>68</sup> Revised Street Light Pilot Proposal at 17-18.

1. The street light metering pilot filed by The Narragansett Electric Company d/b/a National Grid on October 23, 2014 is hereby rejected.
2. The street light metering pilot filed by The Narragansett Electric Company d/b/a National Grid on March 23, 2015 is hereby approved subject to the modifications made herein, particularly the removal of the provision requiring municipal participation.
3. The Narragansett Electric Company d/b/a National Grid shall file a Street Light Metering Pilot consistent with this Order.
4. The Narragansett Electric Company d/b/a National Grid cost recovery proposal is hereby approved. National Grid shall file a tariff consistent with the PUC decision for effect August 1, 2015.
5. The Narragansett Electric Company d/b/a National Grid shall comply with all other orders and instructions contained in this Order.

EFFECTIVE AT WARWICK, RHODE ISLAND ON JULY 1, 2015 AND AUGUST 1, 2015 PURSUANT TO AN OPEN MEETING DECISION ON JULY 1, 2015. WRITTEN ORDER ISSUED MAY 20, 2016.

PUBLIC UTILITIES COMMISSION



Handwritten signature of Margaret E. Curran in black ink.

Margaret E. Curran, Chairperson

Handwritten signature of Paul J. Roberti in blue ink.

Paul J. Roberti, Commissioner

Handwritten signature of Herbert F. DeSimone, Jr. in blue ink.

Herbert F. DeSimone, Jr., Commissioner

**Notice of Right of Appeal:** Pursuant to R.I. Gen. Laws § 39-5-1, any person aggrieved by a decision or order of the PUC may, within 7 days from the date of the Order, petition the Supreme Court for a Writ of Certiorari to review the legality and reasonableness of the decision or Order.