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BOARD OF PUBLIC UTILITIES  
TRENTON, NJ

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*Long*  
*12/17/18*

December 11, 2018

**Via U.S. Mail and E-Mail**

Hon. Aida Camacho-Welch  
Secretary of the Board  
Board of Public Utilities  
44 South Clinton Avenue, Suite 314  
P.O Box 350  
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DEC 13 2018

BOARD OF PUBLIC UTILITIES  
TRENTON, NJ

Re: I/M/O the Verified Petition of Jersey Central Power & Light Company for Approval of an Infrastructure Investment Program (JCP&L Reliability Plus) BPU Docket No. EO18070728

*Case mgmt*  
*list copied*

Dear Secretary Camacho-Welch:

Jersey Central Power & Light (“JCP&L” or the “Company”) filed its proposed JCP&L Reliability Plus Infrastructure Investment Program (“JCP&L Reliability Plus”) in this docket on July 13, 2018. On October 12, 2018, the Company filed an Errata to the Company’s Petition and Direct Testimony relating to the customer benefits estimated in the Company’s cost benefit analysis (“Errata”). In addition, the Company has responded to discovery requests wherein it has identified replacement Schedules DP-1B and DP-2 to the Testimony of Dennis Pavagadhi (see Response to RCR-E-93) and updated pages 131-132 of the Schedule to the Engineering Evaluation and Report for the Install Generators at District Line Shops project (see Response to S-JCP&L-RP-ENG-4, Attachment C).

Accordingly, at the request of and for the convenience of the parties, the Company has attached the following replacement pages for its original July 13, 2018 filing:

- Verified Petition (Ex. JC-1), **page 10** (per Errata);
- Dennis Pavagadhi Direct Testimony (Ex. JC-2), **pages 6 and 42** (per Errata);
- Engineering Evaluation and Report (Exhibit B to Pavagadhi Testimony (Ex. JC-2)), **page 28** (per Errata);

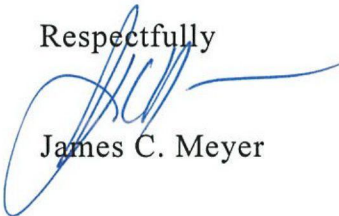
December 11, 2018

Page 2

- **Schedule DP-1B and DP-2** to Testimony of Dennis Pavagadhi (per RCR-E-93); and
- Schedules to Engineering Evaluation and Report, **pages 131-132** (per S-JCP&L-RP-ENG-4, Attachment C).

In addition, by separate cover the Company will provide to the parties (including intervenor NJLEUC) replacement pages 131 and 132 to the Confidential Version of the Schedules to Engineering Report (per Response to S-JCP&L-RP-ENG-4, Attachment B).

Respectfully



James C. Meyer

cc: (Via email with hard copy mailed to designees)  
Hon. Upendra J. Chivukula, Commissioner and Presiding Officer  
Attached Service List

5006970v1

I/M/O the Verified Petition of Jersey Central Power & Light Company for Approval of an Infrastructure Investment Program  
(JCP&L Reliability Plus)  
BPU Docket No. EO18070728  
Service List (December 11, 2018)

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BPU Docket No. EO18070728

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[JCP&L Reliability Plus replacement page 10 for Verified Petition]

and shorten the duration of outages. They will also provide the platform for future smart grid investments, like Volt/VAR control, and support the integration of power flows from distributed energy resources (“DER”) into the distribution system.

23. Underground System Improvements. This category of projects includes: Underground Cable Replacement (replace underground bare concentric neutral cable in areas with pre-1986 construction with new jacketed cable and replace associated underground switches and pad-mounted transformers as needed); Submersible Transformer Replacement (replace submersible transformers with pad-mounted transformers); and Conventional and Network Rehabilitation (reinforce and rehabilitate underground network ducted distribution system and conventional ducted distribution system consisting of vaults, manholes, covers, duct, cable, transformers and switches).

24. Projects in the Underground System Improvements category provide for accelerated replacement of underground cable and submersible transformers. This will increase reliability of service to customers by reducing the number and duration of future outages and will enhance current operations. A programmatic approach will reduce the occurrences where the Company has to make repairs on an emergency basis, which emergency repairs may result in greater costs.

25. As demonstrated in the Engineering Evaluation and Report attached as Appendix B to the Direct Testimony of Dennis Pavagadhi, JCP&L Reliability Plus is estimated to provide benefits to customers of \$1.698 billion, compared to estimated costs of \$400 million (including capital and expense), or a benefit to cost ratio of 4.2.

26. JCP&L Reliability Plus will support economic development and job opportunities in New Jersey. The Board’s Jobs’ Impact statement in its rule proposal cites a Rutgers University study which concluded that, for every \$1 million of utility infrastructure project spending, a total

[JCP&L Reliability Plus replacement pages 6 and 42 for Direct Testimony of Dennis Pavagadhi]

1 notified, and the planned outages will be scheduled in advance to limit customer  
2 inconvenience.

3 The Company's cost benefit analysis estimated storm and general reliability  
4 benefits to customers from JCP&L Reliability Plus of \$1.698 billion, compared to  
5 estimated costs of \$400 million (including capital and expense), or a benefit to cost ratio  
6 of 4.2. Further, JCP&L Reliability Plus will benefit the economy of the State by directly  
7 generating engineering and construction jobs and will support sustained economic  
8 growth, by using new technology that will result in a more reliable and resilient electric  
9 distribution system, which will enhance the State's ability to attract and retain  
10 commercial and industrial investment.

11 As described in the testimony of Mark A. Mader, the Company proposes semi-  
12 annual rate filings for recovery of investments in the Program through a per kWh, per kW  
13 or per fixture charge set forth in a separate clause in its tariff. Board Staff and Rate  
14 Counsel will review each rate filing to ensure that the revenue requirements and proposed  
15 rates are determined in accordance with the II&R Rules and the Board's Order approving  
16 JCP&L Reliability Plus.

17 As described in my testimony below, JCP&L Reliability Plus meets the  
18 requirements of the II&R Rules and should be approved by the Board.

19 **JCP&L's ELECTRIC DISTRIBUTION SYSTEM**

20 **Q. Please describe JCP&L's electric distribution system.**

21 **A.** The Company provides electric distribution service to approximately 1.1 million  
22 residential, commercial and industrial customers, representing approximately 25% of the  
23 metered electric customers in New Jersey. The customer base is 88% residential, 11%



1 estimated to provide benefits to customers of \$1.698 billion, compared to estimated costs  
2 of \$400 million (including capital and expense), or a benefit to cost ratio of 4.2. On a Net  
3 Present Value ("NPV") basis, JCP&L Reliability Plus is estimated to provide benefits to  
4 customers of \$.846 billion, compared to estimated costs of \$335 million (including  
5 capital and expense), or a benefit to cost ratio of 2.5.

6 In addition, JCP&L Reliability Plus includes equipment replacement projects that  
7 will reduce the occurrence of emergency replacements that have much higher costs than  
8 planned replacements. In its proposal of the II&R Rules, the Board noted that emergency  
9 replacement costs can run multiple times over the level of costs incurred in a well-  
10 planned program implemented over time in a cost-effective manner. 49 *N.J.R.* at 2490.

11 JCP&L Reliability Plus is a well-planned Program that could be implemented  
12 over four years in a cost-effective manner to provide these cost-saving benefits.

### 13 REPORTING

14 **Q. What is the Company's proposal for reporting on the progress of JCP&L Reliability  
15 Plus?**

16 **A.** Consistent with the reporting requirements of *N.J.A.C.* 14:3-2A.5(e), the Company  
17 proposes to provide semi-annual status reports to Board Staff and Rate Counsel  
18 containing the following:

- 19 1. Forecasted and actual costs of the Program for the applicable reporting period, and  
20 for the Program to date, where Program projects are identified by major category;
- 21 2. The estimated total quantity of work completed under Program identified by major  
22 category. In the event that the work cannot be quantified, major tasks completed  
23 shall be provided;

[JCP&L Reliability Plus replacement page 28 for Engineering Evaluation and Report that is  
Appendix B of Direct Testimony of Dennis Pavagadhi]

To quantify the benefits to customers associated with JCP&L Reliability Plus, the Company used the Interruption Cost Estimate ("ICE") tool, sponsored by the U.S. Department of Energy ("DOE"). This tool was developed by Lawrence Berkeley National Laboratory and Nexant, based on extensive research. The ICE tool is used to estimate the dollar benefits associated with avoided outages and reductions in restoration time.

The results of the ICE tool analysis for JCP&L Reliability Plus are shown in the tables below, reflecting anticipated dollar benefits from improvements in general reliability and in the Company's ability to restore power following a major storm event, compared with costs (including capital and expense):

Customer Benefit Category	Nominal (\$ in millions)				Benefit/Cost Ratio
	Benefits Storm	Benefits Non-Storm	Benefits Total	Costs	
Circuit Reliability & Resiliency	\$ 164	\$ 920	\$1,085	\$133	8.2
Substation Reliability Enhancement	\$ 66	\$ 130	\$196	\$90	2.2
Distribution Automation	\$ 35	\$ 353	\$388	\$115	3.4
Underground System Improvements	\$ -	\$ 30	\$30	\$62	0.5
<b>Total IIP</b>	<b>\$265</b>	<b>\$1,433</b>	<b>\$1,698</b>	<b>\$400</b>	<b>4.2</b>

*Note that DOE ICE Tool limits storm benefits to 24 hours*

Customer Benefit Category	Nominal (\$ in millions)			NPV (\$ in millions)		
	Benefits	Costs	Benefit/Cost Ratio	Benefits	Costs	Benefit/Cost Ratio
Circuit Reliability & Resiliency	\$1,085	\$133	8.2	\$649	\$112	5.8
Substation Reliability Enhancement	\$196	\$90	2.2	\$62	\$75	0.8
Distribution Automation	\$388	\$115	3.4	\$125	\$95	1.3
Underground System Improvements	\$30	\$62	0.5	\$10	\$52	0.2
<b>Total IIP</b>	<b>\$1,698</b>	<b>\$400</b>	<b>4.2</b>	<b>\$846</b>	<b>\$335</b>	<b>2.5</b>

*Note that DOE ICE Tool limits storm benefits to 24 hours*

These results demonstrate that JCP&L Reliability Plus is expected to produce substantial quantitative benefits for customers and a positive nominal benefit to cost ratio in three of the four project categories. While the estimated benefit to cost ratio for Underground System Improvements is less than 1.0 on a nominal basis, JCP&L believes that accelerated work in this category is necessary to avert anticipated future increases in cable failures, power quality issues and potential safety issues related to aging concentric neutral underground cable. Not surprisingly, it is costly to install underground service and, in this case, to replace underground service in the targeted underground residential developments. Therefore, it likewise should not be surprising that the analysis indicates a lower benefit to cost ratio for this category. Nonetheless, these projects are important to service quality for customers in underground residential developments and are a key component to general infrastructure replacement and renewal. Many of these developments are in very large age-restricted communities in the Central New Jersey Region.

The Company performed the cost benefit analysis using the ICE tool as follows. First, the Company analyzed the historical outage information for circuits addressed in JCP&L Reliability

[JCP&L Reliability Plus replacement pages 131-132 for Schedules to Engineering Evaluation and Report (Public Version) that is Appendix B of Direct Testimony of Dennis Pavagadhi]

## JCP&amp;L RELIABILITY PLUS INSTALL GENERATORS AT DISTRICT LINE SHOPS 2019

COMPONENT	TOWN(S) BENEFITING	DESCRIPTION	OBJECTIVE	COST ESTIMATE	PROJECTED IN-SERVICE DATE
	Washington	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$328,179	First Half 2019
	Whippany	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$381,949	First Half 2019
	Cookstown	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$381,949	First Half 2019
	Point Pleasant	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$444,606	First Half 2019
	Farmingdale	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$404,897	Second Half 2019
	Summit	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$381,949	Second Half 2019
	Hopatcong	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$404,897	Second Half 2019
	Long Branch	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$381,949	Second Half 2019
	Lakewood	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$424,897	Second Half 2019

Schedules to Engineering Evaluation and Report

	Phillipsburg	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$404,897	Second Half 2019
	Toms River	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$404,897	Second Half 2019
	Newton	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$381,949	Second Half 2019
	Union Beach	Install back-up generator at Operation Center.	Full building back-up generation is required to maintain normal operations at district line shops during storms and emergencies.	\$404,897	Second Half 2019
<b>Total 2019 COSTS</b>				<b>\$5,131,910</b>	

[JCP&L Reliability Plus replacement Schedules DP-1B and DP-2 of Direct Testimony of Dennis Pavagadhi]

Ratio of Similar Base Capital to JCP&L Reliability Plus				
Capital Baseline	2019	2020	2021	2022
Proposed Baseline Capital <sup>1</sup>	\$141,000,000	\$141,000,000	\$141,000,000	\$141,000,000
<b>Base Capital Similar to JCP&amp;L Reliability Plus<sup>2</sup></b>				
Distribution Automation	\$1,740,000			
Overhead Circuit Reliability and Resiliency	\$3,800,000			
Underground System Improvements	\$1,640,000			
Substation Reliability Enhancement	\$1,730,000			
<b>Total Base Capital Similar to IIP</b>	<b>\$8,910,000</b>	<b>\$10,200,000</b>	<b>\$10,000,000</b>	<b>\$9,600,000</b>
IIP Capital	\$89,186,659	\$101,580,000	\$99,610,000	\$96,436,000
Base Capital to Total IIP	10%	10%	10%	10%
(1) Proposed baseline is a 5-year average of 2013 - 2017 base capitals spend (2) Company acknowledges it must maintain capital expenditures in base capital at least equal to 10% of JCP&L Reliability Plus				



JCP&L Capital Expenditure Summary 2013-2022  
Identified By Major Categories

Schedule DP-2

	2013	2014	2015	2016	2017
Metering	3,511,323	9,557,573	8,684,953	6,353,165	\$5,227,588
Other	26,614,703	11,741,883	21,596,120	2,236,139	\$6,282,655
Replacements & Improvements	\$41,790,206	\$77,918,555	\$69,752,522	\$69,740,591	\$70,218,984
Vegetation Management	\$7,264,569	\$14,075,284	\$13,251,603	\$12,447,966	\$12,777,019
Reliability	\$12,628,563	\$32,815,760	\$25,092,479	\$25,598,458	\$17,093,356
Street Lighting	\$6,537,720	\$7,418,273	\$6,155,755	\$5,980,031	\$6,177,456
System Reinforcements	\$6,936,747	\$13,351,075	\$8,710,174	\$7,067,841	\$6,572,484
Facilities	\$471,848	\$880,785	\$2,362,541	\$2,178,677	\$9,653,947
Tools & Equipment	\$1,472,189	\$4,566,009	\$3,745,250	\$1,716,197	\$2,548,511
Total Base Capital	\$107,227,868	\$172,325,199	\$159,351,397	\$133,319,066	\$136,552,001
Damage Claims	\$6,610,309	\$8,878,243	\$3,758,234	\$5,095,480	\$4,531,516
Joint Use	\$318,686	\$1,959,592	\$2,668,493	\$1,644,550	\$519,163
New Business	\$20,700,005	\$38,228,291	\$36,127,765	\$42,018,410	\$37,721,964
Relocations	\$4,578,829	\$545,995	\$2,483,689	\$2,172,469	\$1,931,381
Storms	\$23,574,103	(\$13,212,557)	\$1,402,760	\$22,429,556	\$9,751,141
Total Other Than Base Capital	\$55,781,933	\$36,399,564	\$46,440,941	\$73,360,465	\$54,455,164
Total Distribution	\$163,009,800	\$208,724,763	\$205,792,337	\$206,679,531	\$191,007,165

JCP&L Capital Expenditure Summary 2013-2022  
 Identified By Major Categories

Schedule DP-2

	2018	2019	2020	2021	2022
Metering	\$5,997,837	\$6,166,549	\$6,595,985	\$6,684,718	\$6,894,436
Other	\$290,834	\$3,130,940	\$4,973,208	\$682,922	\$18,258,480
Replacements & Improvements	\$64,171,274	\$54,518,868	\$60,408,007	\$62,035,292	\$63,192,568
Vegetation Management	\$21,200,248	\$20,142,320	\$24,640,886	\$25,099,279	\$24,370,329
Reliability	\$36,030,661	\$42,247,453	\$36,923,105	\$34,661,378	\$36,069,087
Street Lighting	\$11,221,624	\$11,080,349	\$11,435,071	\$11,572,940	\$12,063,430
System Reinforcements	\$4,060,580	\$1,093,596	\$8,792,920	\$7,516,954	\$7,598,165
Facilities	\$843,148	\$3,223,548	\$1,027,856	\$952,874	\$892,526
Tools & Equipment	\$3,658,908	\$3,297,897	\$3,403,235	\$5,406,562	\$5,406,287
<b>Total Base Capital</b>	<b>\$147,475,114</b>	<b>\$144,901,520</b>	<b>\$158,200,272</b>	<b>\$154,612,918</b>	<b>\$174,745,308</b>
Damage Claims	\$1,606,936	\$1,728,885	\$2,061,312	\$2,020,277	\$2,241,823
Joint Use	\$1,116,606	\$1,247,826	\$1,207,508	\$1,139,690	\$1,212,417
New Business	\$34,300,409	\$31,690,294	\$34,204,537	\$33,892,889	\$35,548,822
Relocations	\$2,529,457	\$2,545,249	\$2,899,269	\$2,797,743	\$2,921,055
Storms	\$4,080,034	\$4,231,074	\$4,344,907	\$4,640,998	\$4,867,355
<b>Total Other Than Base Capital</b>	<b>\$43,633,442</b>	<b>\$41,443,328</b>	<b>\$44,717,533</b>	<b>\$44,491,597</b>	<b>\$46,791,472</b>
<b>Total Distribution</b>	<b>\$191,108,556</b>	<b>\$186,344,848</b>	<b>\$202,917,805</b>	<b>\$199,104,515</b>	<b>\$221,536,779</b>